Faculty of Computer Science and Information Technology,
University of Malaya



**WXES 3182 : Projek Ilmiah Tahap II**

# WELLNESS INTEGRATED INFORMATION SYSTEM

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# ABSTRACT

Wellness Integrated Information System is a web-based system with an integrated database developed especially for the used of University of Malaya Total Wellness Programme. Wellness Integrated Information System is designed to create an information rich environment of wellness resources, that is accessible and available. The users of the system are categorized into 4 main groups, namely, the Wellness Administrator, Committee Members, Participants and Visitors.

The Wellness Integrated Information System includes 6 modules that are Login and Logout, Question & Answer Board, Information Resources, Search, Help and Notice Board Module. The users of the system will be allowed different access level. Only authorized users will be allowed to create, maintain and make changes, delete or update the database under their respective scope. In order to ensure authorized access to the system, user's login and password validation will be required.

The development methodology selected in building this system is the Waterfall Model with Prototyping. Wellness Integrated Information System is developed using open source. Thus, the development tools include PHP ( Hypertext Preprocessor ) as the system's server side scripting language, MySQL as the database and Apache as the web server. The combination of PHP and MySQL together with Apache server on a three-tier architecture is guaranteed to optimize performance. Besides that, Microsoft Internet Explorer 6.0 will be used as the web browser and Windows 2000 as the operating system. Interface development tools used are Macromedia Dreamweaver MX 6.0, Microsoft Frontpage and Adobe Photoshop 6.0.

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# CHAPTER 1 : INTRODUCTION

## 1.1 Project Overview

### 1.1.1 Introduction To Wellness

It is never too late to set goals to live a healthier life. Wellness is a way of life and the process is endless. It is important to realize that everything we do, think, feel and believe has an impact on our state of health. Malaysians are slowly realizing the importance of healthcare and as such is now beginning to take an interest in their healthcare. As the saying goes 'prevention is better than cure' and for this reason we need to maintain a healthy lifestyle in order to lead a normal life while reducing the risks of succumbing to lifestyle diseases. Wellness is also an active process of becoming aware of and making choices that will lead to a better health and a more meaningful existence. One of the main goals of the Wellness Programme, is to reduce the risks of developing lifestyle diseases and therefore prolonging life. The University of Malaya Wellness Program is developed with this in mind to ensure a positive and healthy life. In the concept of wellness you take charge of your health and provide the tools by which you can achieve an optimal health and wellness through educational offerings and health screenings. The road to good health begins with self-responsibility.

Wellness involve eight dimensions, each an important facet of life. These dimensions are the social dimensions, physical dimensions, spiritual, emotional, nutritional, intellectual, occupational and environmental. A wellness lifestyle helps an individual achieve a balance and satisfactory life. It gives a sense of purpose, inner peace, satisfaction and the chance to see ourselves for the wonderful individual that we are. Wellness is further defined as a framework that can be used in many

ways to help in organizing, understanding and balancing human growth and development. Therefore, there is a need for a wellness program that is accessible and affordable. With this in mind, the University of Malaya's Wellness Programme aims to provide the basic information on leading a healthy lifestyle and the knowledge on the prevention of diseases to the campus community and eventually to the nation.

### 1.1.2 Introduction Of Wellness Programme

The University of Malaya Total Wellness Programme is a multidisciplinary programme involving medical and physical screening as well as monitoring in the form of diet, life style, exercise and etc. The main purpose of the programme is to build a healthier campus community as a start, and subsequently the Malaysian society in general. Throughout this programme, a lot of data has been collected and will continue to be collected. The different departments/centers involved in the programme, such as, the Medical Faculty and the University Malaya Medical Center (UMMC), the Dental Faculty, the Student Health Clinic, the Sports Center and the Biomedical Department of the Engineering Faculty will carry their own data collection activities, which will require a storage facility. At the same time, each department may want access to the data collected by the other departments. As such, there is a need to develop an integrated information system that will allow for greater accessibility and understanding of the health conditions and interventions necessary for each of the parties involved. The development for the Wellness Programme system will be an integrated information system known as Wellness Integrated Information System which will be in the form of a website and an integrated

database. This system will provide members with access to medical and health care information through a web browser.

The Wellness Integrated Information System will be developed for four types of users, namely :

i) **Wellness Administrator (Wellness Admin)**

This is the person(s) in charge of the overall system. Their task is to manage the information portal and also the medical records in the database. Administrators will be provided with a login and a password in order to access the system. Their role is to manage the information portal and the medical records in the database. They can also:

- View all default modules
- Register/unregistered members into system.
- Input, delete, edit and update medical data on behalf of the members.
- View participants' medical screening result.
- Read all the general articles, links provided in the website.
- Post questions on the Question and Answer (Q&A) discussion/ forum board.
- Put notice into the system's notice board

ii) **Committees Members**

These are the committee members of the wellness program who are in charge of the overall progress of the program and may be involved in the data collection process of the participants of the programme. They consist of the staff from the University of Malaya Centre for Continuing Education (UMCCED) the financier

of the project; staff from the University of Malaya Medical Centre (UMMC) or the Medical Faculty who provided medical screening and was responsible for the academic sessions in healthcare; staff from the Sports Centre who are responsible for the physical fitness intervention and sports psychology; and the staff from Faculty of Computer Science and Information Technology who is responsible for building the portal. The committee members who are authorized users of the system are able to access and write into the database. They generally can:

- View all default modules
- View participants' medical screening result only with the permission of the Wellness Administrator.
- Read all the general articles, links provided in the website.
- Post questions on the Question and Answer (Q&A) discussion/ forum board.
- Post notice into the system's notice board.

iii) **Participants**

These are members who participate in the medical screening, academic sessions and physical fitness intervention of the programme who may want to view data concerning their own self. First time users of the system need to register for a member account. Participants can:

- View all default modules
- View their own personal medical/physical screening result.
- Read all the general articles, links provided in the website.
- Post questions on the Question and Answer (Q&A) discussion/ forum board.

iv) **Visitors**

These may be any users who are merely visiting the web site or portal. These are users who are merely browsing the website in order to obtain general information about the programme. These users have limited access to the system who are allowed to:

- Read all the general articles, links provided in the website.
- Post questions on the Question and Answer (Q&A) discussion forum board.

The users of the system will be allowed different access level. Only authorized users will be allowed to create, maintain and make changes, delete or update the database under their respective scope. In order to ensure authorized access to the system, user's login and password validation will be required. The Wellness Integrated Information System aims to provide the basic knowledge on healthy living and disease prevention. Targeted market segment includes all walks of life. The pilot project is only offered to the staff of University of Malaya. Upon the successful completion of the pilot project, the programme will be packaged, with a view of commercialization, as a successful formula that will reduce the overall health care costs. Members of the program will enjoy privileges such as personal medical screening, exercise, stress management, diet and etc. This will be discussed in the later chapters of this thesis.

## 1.2 Project Objectives

**General Objectives**

The general objectives of this project is to develop a Wellness Integrated Information System that will :

a) Be specific to the needs of 4 groups of populations which include sports science student and doctors

b) Provide wellness information and services for different category of members who are interested but may not necessarily follow-the formal routines of the intervention module of the wellness programme.

c) Ensure authorized access to the features and data of the system by member registration.

**Specific Objectives**

The specific objectives of the project are:

- Validation of user's login in order to access the system. This will ensure the security of the system. Only authorize personnel will be permitted access to the database.
- To provide template for inserting new articles/links/information. The wellness administrator can easily upload new medical articles, links and information by clicking the mouse and typing through the keyboard. The medical articles, links and information will then be displayed on the computer screen.

- To provide a notice board for the Wellness Administrator and committees members to upload notices on the web by clicking the mouse and typing through the keyboard.

## 1.3 Project Motivation

The Wellness Integrated Information System has been developed as a response to increasing awareness on health care issues. It is envisioned to be of high demand amongst trusted health care services providers. The Wellness program is a total programme involving medical and psychological screening, health and dental education, diet and nutrition, sports psychology, physical fitness intervention and monitoring. Therefore, the Wellness Programme is foreseen to receive an overwhelming response from the general public.

## 1.4 Project Structure

The development team for the Wellness Integrated Information System website are two Final Year Bachelor of Information Technology undergraduates students from Faculty of Computer Science and Information Technology, namely, Mr. Leong Weng Liong ( WET 010058 ) and Ms. Tung Ka Yin ( WET 010158) under the supervision of Assoc. Prof. Dr. Sameem Abd. Kareem.

The two members of the team will be in charge of different modules, namely, Ms. Tung Ka Yin will be put in charge in creating generic forms to input medical test screening, a Question & Answer Forum to communicate among the committee's

members and participants. Furthermore, Ms. Tung is also in charge of the overall security of the website and database.

Mr. Leong Weng Liong will be in charge of creating generic templates for uploading articles and news to the website and also a notice board that enable the wellness administrator and committee members to post important notices. Mr. Leong is also responsible in creating the system's login and logout that will restrict the users to the system. Only authorize users will be allowed to create, maintain and make changes, delete or update the data under their respective scope.

## 1.5 Project Scope

This project is developed to provide the following functions

i) The project will be developed in the English Language only.

ii) Medical and psychological screening tests suggested in the Portal are meant for general situations only and are not customized to allow for personal medical conditions.

iii) The website will provide wellness information in several modules that include health records, articles, organization and others.

iv) The system is targeted to the members of the wellness programme committee and all staff of the university who may or may not participate in the programme.

v) The system developed will be able to provide a login/logout function.

vi) The system will be able to provide a template for inserting new articles and links.

vii) The system will provide services to four categories of users, namely, The Wellness Administrator, Committees Members, Participants and Visitors.

General specifications and features of the Wellness Integrated Information System are:

i) **Security**

- A password is required to access levels of the system and an authorized user will be allowed to change the password anytime.
- A participant can only view his or her own medical or physical data without having access to others' data.
- The committee members may not have the same security level. A committee member may only see participants data which are private and confidential in nature if he or she personally collected the data. Otherwise the member needs the permission of the participants to view the data.

i) **Member Registration**

- The system requires registration of members. Members will register according to different categories such as Wellness Administrator, Committee or Participant.
- Guests that are just visiting the portal are not required to register for a user name and password.

iii) **Data Entry**

- Wellness Administrator, Committee Member and Participant are allowed to enter medical or physical data into the database.
- Participant is only allowed to enter limited data compared to Wellness Administrator and Committee.
- Guests are not allowed to enter data into the database.

iv) **Search**

- The system will provide search method for users to find articles related to the keyword(s) that they key in.
- Users can also search for the questions and answers from the forum that match a particular search criteria.

v) **Notice Board**

- This is for the Wellness Administrator or authorized users to publish any announcements or latest news. All users can view the board from time to time to keep abreast with the current or latest news.

vi) **Help**

- This facility is to guide the user in order to help them to surf the system. Help is also provided on solving their problems faced when using the search methods. Frequently asked questions (FAQ's) about the site are also included in this module.

## 1.6 Project Schedule

The project schedule serves as the time guideline for a developer to determine what type of task to be carried and what goals should be achieved when a certain milestone is met. Sometimes due to unforeseen factors, certain tasks have to be prolonged. The development schedule of the Wellness Integrated Information System may change as the requirements of the system change.

In order to accomplish the project in time, a project schedule has been formulated to act as a guidance as proceed through the development process. The schedule was drawn using Microsoft Project 2000 software development template.

The schedule is rather tight in its nature. As the development process of this project is not full time as I also have to cope up with other courses as well in the same time, so once in a while, the start time of some activities will be delayed or the time for some activities will be shortened accordingly, based on the situation which I face.

While formulating this schedule, a lot of considerations have been taken into account, such as, the time the system developer may need to focus on his other courses. For this reason there may be a delay in beginning some of the activities involved. As such, a little extra time reserved for each of the activities scheduled. I The developer intends to begin the next activity as soon as the previous activity has been accomplished.

In conclusion, the developer will try my best to follow the schedule as close as possible so that the project can be accomplished smoothly as planned in the project schedule drawn.

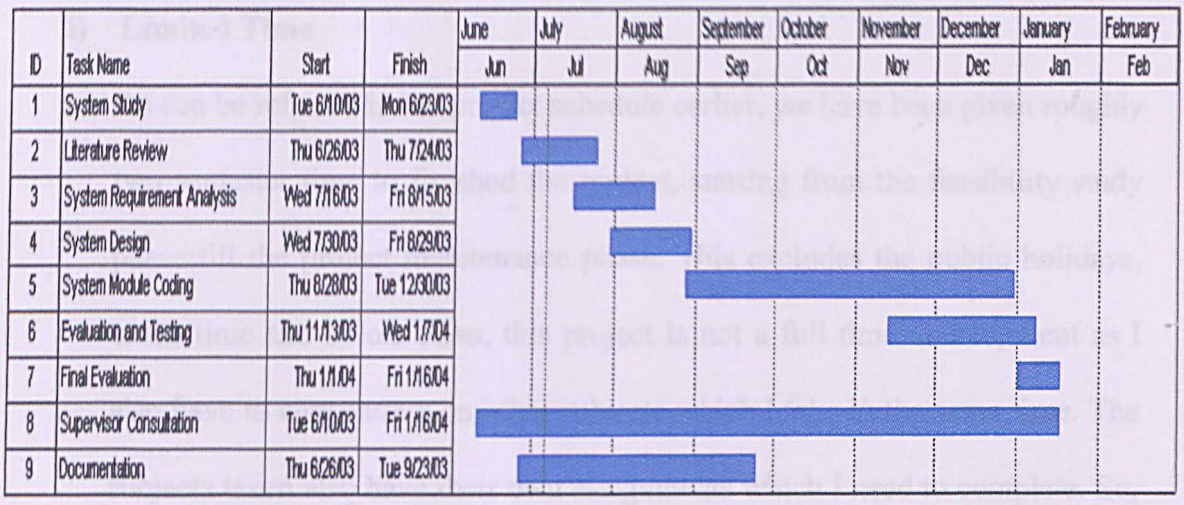



**Figure 1.1 Gantt Chart on Project Schedule for Wellness Integrated Information System**

## 1.7 Project Constraints

As usual, every project development faces its own set of constraints. The same applies to this project too. However, this is a non-commercial software development process but merely a final year thesis for Computer Science and Information Technology undergraduates, so tight budget is not the major issues for this particular project.

As early as the planning phase, several major constraints have been identified. They are the limited time, inexperience and limited human resources. Apart from these major constraints mentioned, several minor constraints have been identified as well. These are the limited reference books, budgets and some technical constraints.

i) **Limited Time**

As can be referred in the project schedule earlier, we have been given roughly two semester time to finished the project, starting from the feasibility study phase till the project maintenance phase. This excludes the public holidays, exam time and so on. Also, this project is not a full time development as I also have to concentrate on other subjects which I take in the same time. The subjects taken also have their own assignments which I need to complete. So, time allocated is really very limited and tight.

ii) **Lack of Medical Knowledge**

This project is closely related to the field of health and medicine, considering the developers of this Wellness programme are all Information Technology students, it is obvious that the developers do not have enough knowledge related to the health and medical fields and its practice in detail. Furthermore, there are many medical terms and jargons that are commonly used in the medical field are virtually unheard of prior to this and thus have to rely on encyclopedia and Internet for help. All this will limit the developer's thorough understandings of the topics.

iii) **Limited Manpower**

In my point of view, it is rather difficult for only two persons to complete the whole system as the scope of this project is rather large and there are a lot of business constraints and logics that we have to consider when developing the system. In fact, I would like to suggest that additional one or two persons are needed to ease the development.

iv) **Limited Reference Books**

When developing the project, I was unable to get the reference books needed from the UM library. They are too few and with limited amounts. So, they are either in order process or have been borrowed out.

v) **Limited Budget**

Limited budget which I am referring here is my personal budget to buy reference books and to upgrade my personal computer. The reference books sold are rather expensive with each of them cost around 150 and above. So, I have to limit myself to a few references only. As this technology rather new, so greater system requirements is needed in order to run the software. Therefore, I needed to spend to upgrade the specifications of my personal computer to the recommended requirements stated in order to run and develop the system.

## 1.8 Project Limitation

i) **Computer languages**

For the development and coding of this program, the developers have agreed to use PHP ( Hypertext Preprocessor ) and MySQL as the development tools. This is a relatively new programming language to the developers and has yet to be taught in the lectures in university. There are also less resources regarding to PHP and MySQL available as compared to other computer language. In the coding stage of this project, this lack

of programming experience using the language could limit the developer's ability to code the system.

**ii) Computer hardware consideration**

This project requires the use of computer that could functions as server and client respectively. This computer should have substantial processing speed and also large storage capacity. The computer that developers need to make full use of the facility will be provided by the faculty for setting up, configure and coding of the system. The usage of computer is limited to the hours when lab is open. This could potentially limit the developer's flexibility in coding at any time deemed suitable.

**iii) Constraints in software development**

Business ethics have to be fast and cost effective to ensure their survival in the ever fast changing environment today. So, lifecycle of the software development is inevitably affected by these changes too. Time and resources constraints are the major issues in software development while fulfilling all the business requirements is a must.

**iv) Difficulty in system maintenance**

While the developed systems are getting larger and more complex and thus the systems are prone to more errors. So, keeping the software easy to debug and maintain are few other very important aspects. When the business operation gets larger, the system has to be able to scale itself to coup with the greater demands is another added feature.

v) **Issues of User Friendliness Interface Design**

Overall the system is quite simple and straightforward in nature. However, due to the lacking of documentation and help functionality and also some aspects poor interface design such as deep linking and unrecoverable actions and inadequate user status and information, the need for redesign the interface is need to achieve the better clarity, ease of use and lastly but not least important, more attractive and interactive graphical interface design.

## 1.9 Expected Outcome

The expected and planned outcome of this project is a web-based integrated information system for the University of Malaya's Total Wellness Programme. The features of the system include:

i) Authentication of authorized users through various methods such as login forms, cookies and session expiration.

ii) Multilevel Security.

iii) Information on the Total Wellness Programme concept.

iv) Simple and user-friendly upload for medical articles, link and information.

v) Acceptable respond time for data retrieval

vi) Provision of data input/error validation.

vii) Access to users own health/physical screening profiles.

viii) A comprehensive and easy to understand documentation and help files

## 1.10 Report Structure

This thesis consists of eight chapters. The purpose of this layout is to give an overview of the major phases involved during the development of the project. The structure of the thesis is as follows:

**(a) Chapter 1 – Introduction**

This chapter introduces the overview of the project proposal. It includes sections on project overview, project motivation, outlined objectives, project scope, project limitation, expected outcome and development schedule.

**(b) Chapter 2 – Literature Review**

This chapter discusses and summarizes the literature review on the problems faced by existing systems and other similar systems. The review is based on various sources such as online website, articles and reference books. Besides that, a brief overview on all the relevant technologies in the market will be included as well.

**(c) Chapter 3 – Methodology**

This chapter discusses in great detail the reason for using the methodology chosen in the software development process. A wide scope of techniques is used to define the system requirements. Apart from the study on system requirements, the mechanism and technology used in this project is explained and justified.

**(d) Chapter 4 - System Requirement Analysis**

This chapter documents the result of the requirements analysis captured in terms of functional, non-functional and technical requirements. The system requirement analysis phase is meant to identify the system's functional and non-functional requirements as well as the software and hardware requirements that are needed to support the identified system functions.

**(e) Chapter 5 – System Design**

The Waterfall Model with prototyping, that is, the three – tier application architecture, interface design and logical data flow design is discussed in this chapter. In addition, the conceptual design, logical design and physical design of the system are also described.

**(f) Chapter 6 - System Implementation and Development**

This chapter describes in great details the development and implementation of the system's modules.

**(g) Chapter 7 – System Testing**

This chapter discusses the testing plan formulated to test the proposed system. The testing carried out is based on several test cases which simulate different kinds of operation scenarios.

**(h) Chapter 8 - Discussion**

In this chapter the achievements of the proposed system, the limitations and prospective refinements and upgrades is discussed.

# CHAPTER 2 : LITERATURE REVIEW

## 2.1 Definition of Literature Review

A literature review summarizes, interprets and evaluates existing "literature" ( or published material) in order to establish current knowledge of a subject. The purpose of doing so relates to ongoing research to develop that knowledge: the literature review may resolve a controversy, establish the need for additional research and define a topic of inquiry.

## 2.2 Purpose of Literature Review

The purpose of literature review is to establish current knowledge on an issue. Besides, the main purpose of the literature review is to guide students or researchers to use the best way to access and analysis information and synthesize and evaluate it according to the guiding concept. It helps students to develop their information seeking and critical appraisal skill.

## 2.3 Information Collection Techniques

It is necessary to collect from various sources to seek further understanding for this new system. The information collected assist in the system analysis and requirement section. Several techniques have been adapted in order to elicit all of the information required such as Internet surfing, referring to printed documents, analyzing pass year thesis, software testing and conducting discussions with friends and lecturers.

**i) Internet Surfing**

Internet surfing is the major source due to its high speed and up-to-date information. Therefore, Internet is the main source for information seeking. Majority of the Wellness programme system are found through this technique. Besides that, relevant information on web application, client-server and programming tools are been obtained.

**ii) Referring to printed documents**

Reference books especially on methodology and system design can be found from the library. These books provide sufficient information to gain a better understanding about the concept of choosing the right methodology and system design.

**iii) Analyzing Pass Year Thesis**

Several pass year thesis documentation have been studied in order to identify any potential mistakes and to gain some skills on software development.

**iv) Software testing**

Relevant software and web development tools have been tested out to evaluate their suitability for the development of this system.

**v) Conducting discussions with friends and lecturers**

Useful advises have been given to each section meeting conduct with my supervisor. It is very useful as is acts as a reminder when carrying out the system development process and also useful for error correctness.

## 2.4 Review Of Similar Existing Systems And Previous Projects

### 2.4.1 Review of Similar Existing Systems

In order to have a better understanding on the current existing related medical web sites, few of them had been selected and evaluated. All of the information and data collected from these web sites give ideas and the whole concept of what a medical information web site should have. Below are some of the examples of the medical related website:

#### 2.4.1.1 Friday Online Fitness Center

Date Accessed : 15 July 2003

URL : http://www.fitday.com

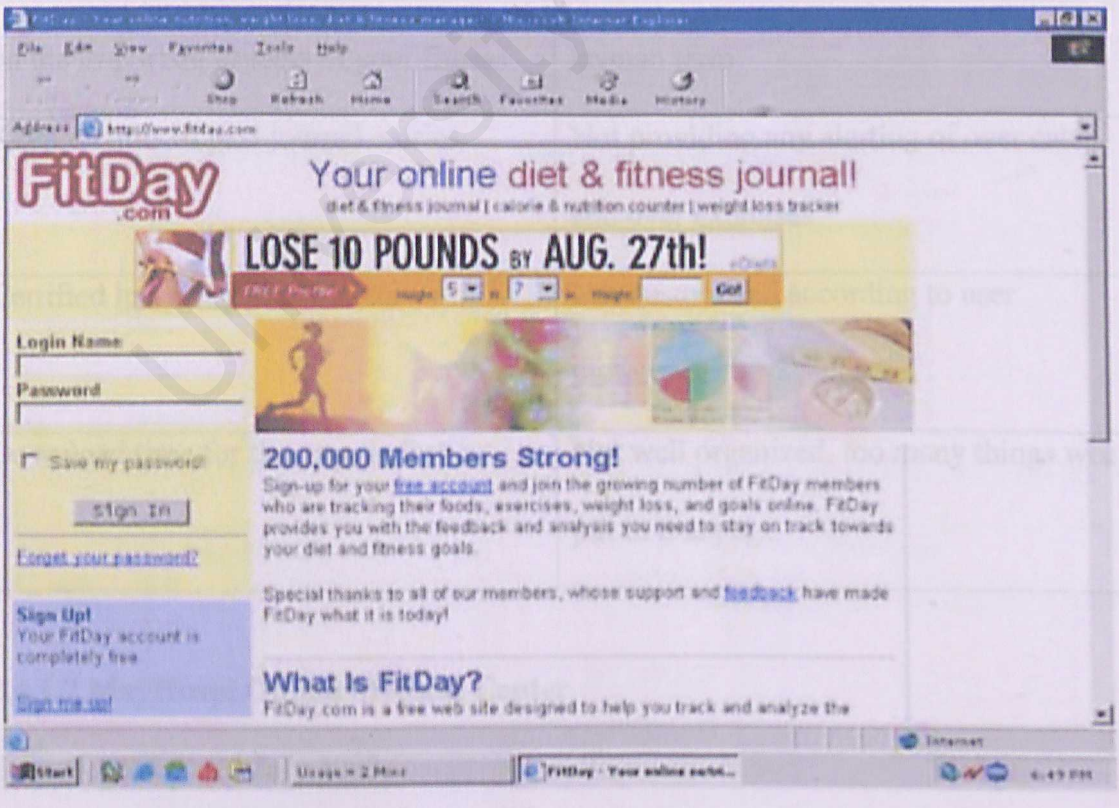



**Figure 2.1 : Friday Online Fitness Center**

This portal focuses only on the fitness of its members. Rather than providing a vast range of medical information, this portal furnishes members with a wide variety of health tools. This system is able to track their users' foods, exercises, weight loss and goals online. FitDay provides their members with the feedback and analysis their need to stay on track towards their diet and fitness goals.

**Table 2.1 Strengths and Weaknesses of Friday Online Fitness Center**

| Strengths | Weaknesses |
|---|---|
| User friendly | Not much information about health and fitness provided |
| Totally free web site designed to help you track and analyze important aspects of your diet and fitness | Targeted users are US residents |
| System can generate 7 graphical reports on the important aspects of your fitness | Terms used in the system are not a layman term |
| Keep records of past journal entries | Not providing any alerting of over eaten and over exercises |
| Certified information and links | Not customized according to user preference |
| Download time for the page is fast | Not well organized, too many things wee put in one page |

**2.4.1.2 MayHospi Online Medical Center**

Date Accessed : 15 July 2003

URL : http://www.mayhospi.com

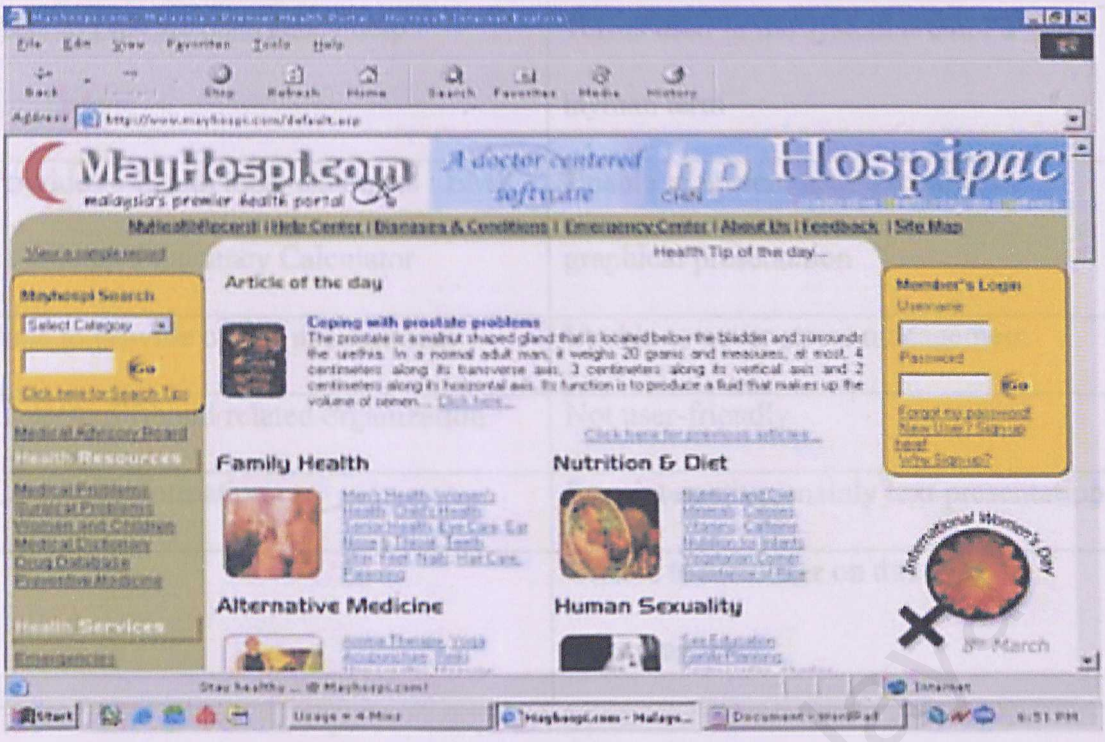



**Figure 2.2: MayHospi Online Medical Center**

MayHospi is a fully Malaysian portal that targets Malaysian as its main users. It provides health management services such as keeping personal medical records, e-health tools, emergency center and simple diagnostic tools. The wide range of content covers family health, exercise and fitness, nutrition, human sexuality, health issue, alternative medication and others. MayHospi also provide interactive communication such as emailing, on-line forum.

**Table 2.2: Strengths and Weaknesses of MayHospi Online Medical Center**

| Strengths | Weaknesses |
|---|---|
| Able to keep multiple health records | Not able to customized according to user preference |
| Scope of content covers a vast range of information | Do not provide a list of medical screening tests |

| | |
|---|---|
| Able to provide emergency help | Terms used in the system are not a layman term |
| Provides e-health tools examples : BMI calculator, Pregnancy Calculator | Unable to present user's records in graphical presentation |
| Able to provide online appointment | Unable to cover stress management |
| Links to different related organization | Not user-friendly |
| Certified information | Less interactive, mainly text presentation |
| | Unable to alert user on due date for screening tests |

### 2.4.2 Review of Similar Previous Projects in FSKTM

#### 2.4.2.1 A Web Based – The Healthcare Management System

System developer: Muhammad Farid Abdullah (WET 98139)

The Healthcare Management System developed by Mr. Muhammad is divided into 5 modules which are Forum (Discussion Board), Help module (User Manual), Discussion Room, Message Board, and Database. The main healthcare categories covered by this system include Men's Health, women's Health, Children's Health, Nutrition, Mental Health, Life Style, Alternative Medicine and latest medical news.

**Table 2.3: Advantages and Disadvantages of Web Based – Healthcare Management System**

| Advantages | Disadvantages |
|---|---|
| Provides search engine | Design of the system structure is untidy |
| Web site is enhanced with multimedia features such as image and animation | Does not have support from any medical professional (such as medical officer) |
| Provides forum board to let users exchange opinions about various health problems and medical issues | |
| Provides linkages to other relevant medical websites for further reference | |
| Provides current health and medical news | |
| Totally free | |

### 2.4.2.2 Online Pediatrician

System Developer: Koh Yung Sing (WEK 98114)

Online Pediatrician is a web-based multimedia system that provided information on the healthcare of children for parents. This system would mainly provide answers to common and general health of Asian Children from birth up to 5 years of age. The topics covered by Online Pediatrician are general healthcare information, immunization, nutrition and fitness, general infection and ailment, growth and development and first aid and safety, search engine and advance search engine are provided in this web site to enhance the quality of information seeking.

This site will also facilitate friendly and interactive user interface. Graphics and animation will accompany text and data displayed to foster an expedition grasp of the facts being conveyed.

**Table 2.4: Advantages and Disadvantages of Online Pediatrician**

| Advantages | Disadvantages |
|---|---|
| The scope of this project is narrower compared to other healthcare web sites as it only focuses on children between the age from 0 to 5 | Does not provide user with any interactive feature (such as discussion board) for further discussion or further inquiry about healthcare issues |
| | Does not have support from any medical professional (such as medical officer) |

## 2.5 Consideration of Client/Server Architecture

### 2.5.1 Client/Server Architecture Introduction

The term client/server was first used in the 1980s in reference to personal computers (PCs) on a network. The client/server software architecture is a versatile, message-based and modular infrastructure that is intended to improve usability, flexibility, interoperability and scalability as compared to centralized, mainframe, time-sharing computing. A client is defined as a requester of services and a server is defined as the provider of services. A single machine can be both a client and a server depending on the software configuration.

As a result of the limitations of the file sharing architecture, the client/server architecture emerged. This approach introduced a database server to replace the file server. Using a relation database management system ( DBMS ), user queries could

be answer directly. The client/server architecture reduced network traffic by providing a query response rather than total file transfer. It improves multi-user updating through a graphic user interface ( GUI ) front end to a shared database. In client/server architecture, Remote Procedure Calls ( RPCs ) or standard query language (SQL) statements are typically used to communicate between the client and server. Examples of client/server architectures are two-tier and three-tier architectures.

### 2.5.2 Two-tier Architecture

With two-tier client/server architecture, the user system interface is located in the user's desktop environment and the database management services are in the server that services many clients. Processing Management is spilt between the user system interface environment and the database management server environment (as depicted in Figure 2.3 below). The database management server provides stored procedures and triggers.

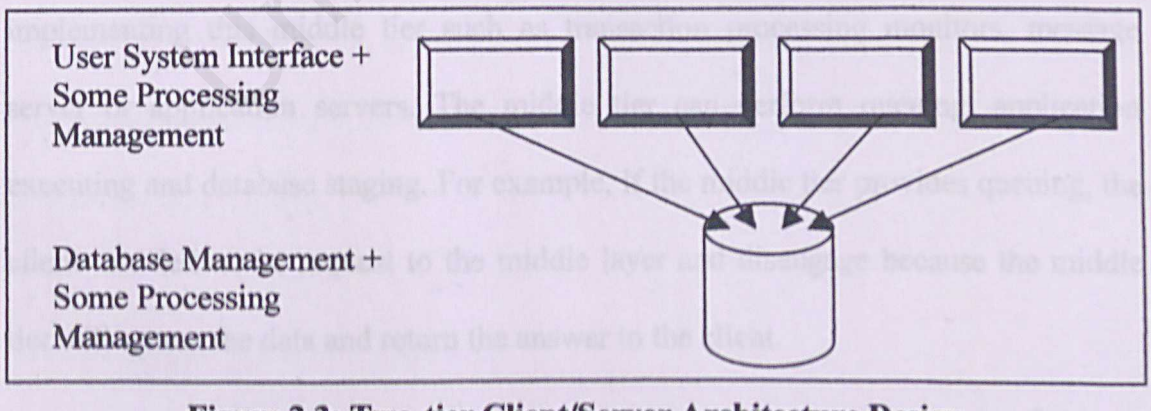



**Figure 2.3: Two-tier Client/Server Architecture Design**

The two-tier client/server architecture is a good solution for distributed computing when work group are defined as a dozen 100 people interacting on a LAN simultaneously. It does have a number of limitations. When the number of users exceeds 100, performance begins to deteriorate. This limitation is a result of the server maintaining a connection via "keep alive" messages with each client, even when no work is being done. A second limitation of the two-tier architectures is that implementation of processing management services using vendor proprietary database procedures restricts flexibility and choice of DBMS for application. Finally, current implementations of the two-tier architectures provide limited flexibility in moving ( repartitioning ) program functionality from one server to another without manually regenerating procedural code.

### 2.5.3 Three-tier Architecture

In the three-tier client/server architecture, a middle tier was added between the users system interface client environment and the database management server environment ( as shown in Figure 2.4 below ). There are a variety of ways of implementing this middle tier such as transaction processing monitors, message server or application servers. The middle tier can perform queuing, application executing and database staging. For example, if the middle tier provides queuing, the client can deliver its request to the middle layer and disengage because the middle tier will access the data and return the answer to the client.

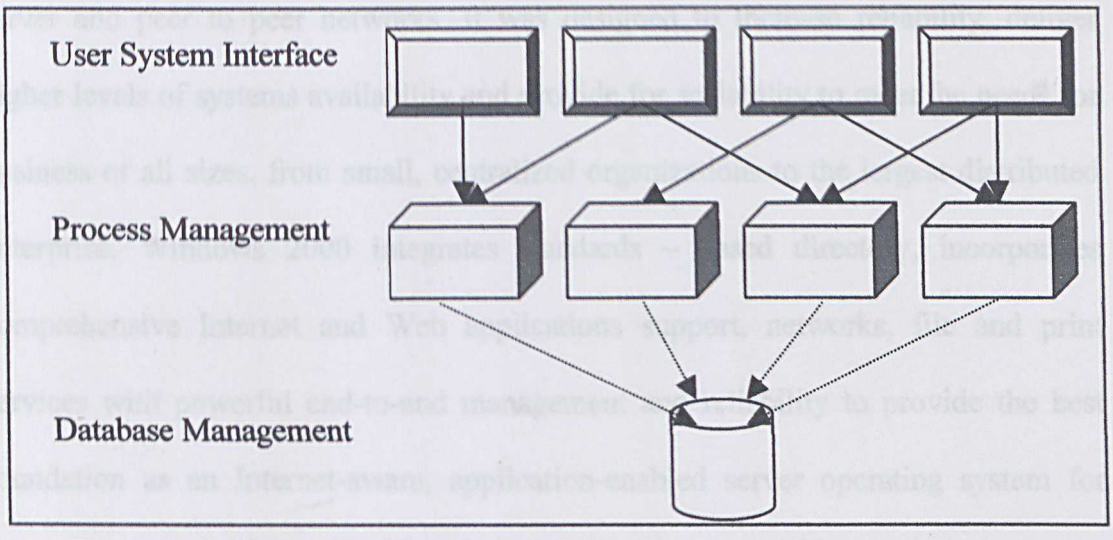



**Figure 2.4: Three-tier Distributed Client/Server Architecture Design**

This client/server architecture has been shown to improve performance and flexibility for groups with a large number of users ( in the thousands ). A limitation with three-tier architectures is that the development environment is reportedly more difficult to use than the visually oriented development of two-tier applications.

## 2.6 Development Platform ( Operating System )

Operating system ( OS ) is a platform that performs basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk and controlling peripheral devices such as disk drives and printers.

### 2.6.1 Microsoft Windows 2000

Microsoft Windows 2000 is a multipurpose operating system that is built on NT technology. It has proven to be very stable with integrated support for client –

server and peer to peer networks. It was designed to increase reliability, deliver higher levels of systems availability and provide for scalability to meet the needs for business of all sizes, from small, centralized organizations to the largest distributed enterprise. Windows 2000 integrates standards – based directory, incorporates comprehensive Internet and Web applications support, networks, file and print services with powerful end-to-end management and reliability to provide the best foundation as an Internet-aware, application-enabled server operating system for integrating your business with the Internet.

### 2.6.2 Linux

With the host of performance enhancements that will benefit Web sites and Internet sites of all sizes, Linux has become extremely popular over the last couple of years. Linux also has a variety of supporting tools and the number is increasing because Linux is becoming more famous day after day because it is free.

Linux has made progress, primarily in functionality important to Internet infrastructure and Web server capabilities, including a greater selection of drivers, easier installation and GUI-based front ends for Web administration and window management.

### 2.6.3 UNIX

UNIX is a popular multi-user, multitasking operating system developed at Bell Labs in the early 1970s. Created by just a handful of programmers, UNIX was designed to be small, flexible system used exclusively by programmers. UNIX has

many unique features. Like other operating system, the UNIX system is a control program for computers. It also has a family of utility programs and a set of tools that allows users to connect and user uses these utilities to build system and applications.

Due to its portability, flexibility and power, UNIX has become the leading operating system for workstations. However, UNIX is more difficult to learn and isn't as widely supported as Microsoft Windows 2000. Historically, it has been less popular in the personal computer market.

## 2.7 Technology Consideration

### 2.7.1 Server – side Programming Technology

#### 2.7.1.1 Hypertext Preprocessor (PHP)

PHP ( recursive acronym for PHP : Hypertext Preprocessor ) is an open source server side scripting language for creating dynamic web pages for e-commerce and other web applications ( Zend.com, 2002). This technology is quite similar to Allaire's ColdFusion, JSP ( Java Server Page ) and ASP ( Active Server Page ). PHP scripts are often embedded in the HTML code of page, and then get parsed on the server – side. This would only allow the browser to see plain HTML only.

PHP's syntax is similar to that of C and Perl, making it very easy to learn for anyone with basic programming skills. It's elegant design makes PHP significantly easier to maintain and update than comparable scripts in other languages ( Zend.com, 2002 ). The PHP language is a mix between the two, taking the best features from both and adds features to solve common problems that programmers often encounter

when programming for the web. And, because PHP is executed on the server, the client cannot view the PHP code.

PHP offers excellent connectivity to most of the common databases ( including Oracle, Sybase, MySQL, ODBC and many others ). PHP also offers integration with various external libraries, which allow the developer to do anything from generating PDF documents to parsing XML. PHP can perform any task that CGI program can do, but its strength lies in its compatibility with many types of databases. Also, PHP can communicate across networks using IMAP, SNMP, NNTP or POP3. It also supports WDDX complex data exchange between virtually all Web programming languages.

**2.7.1.2 Active Server Page ( ASP )**

Active Server Page (ASP) is a server-side scripting environment that can be used to create and run dynamic, interactive, high performance Web Server applications. ASP is server - generated page that can call other programs to do things like access database, serve different pages to different browsers. ASP is almost as efficient as writing code directly to the server's application program interface and it's a lot more efficient than Common Gateway Interface ( CGI ) because it was as a service and can take advantage of multithreaded architectures.

Active Server Pages is an open, compile – free application environment in which can combine HTML scripts and reusable ActiveX server components to create dynamic and powerful Web – based business solutions. Active Server Pages enables server – side scripting for Internet Information Server ( IIS ) with native support for both VBScript and Javascript. However, most ASP pages are creating using

VBScript. VBScript has the most English like syntax which many web developers have experience with. ( Mitchell & Atkinson, 2000 ).

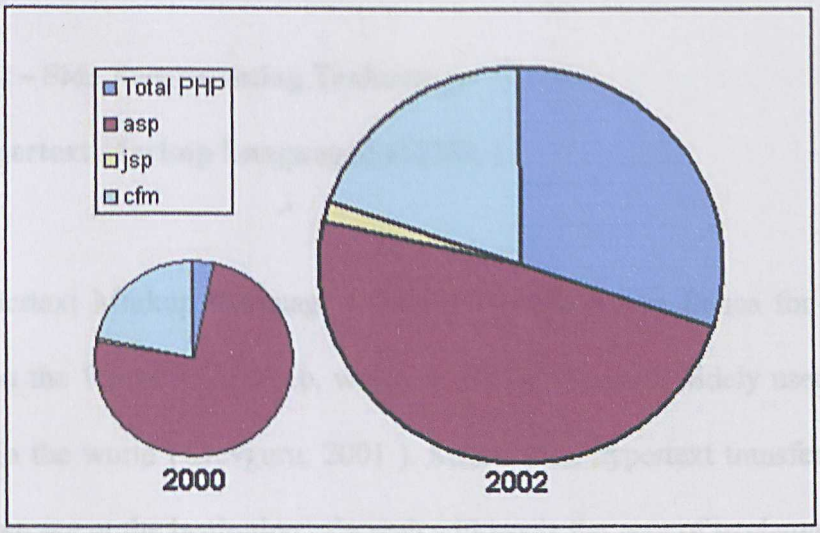
### 2.7.1.3 Java Server Pages ( JSP)

Java Server Pages (JSP) technology allows web developers and designers to rapidly develop and easily maintain, information rich, dynamic web pages that leverage existing business systems. JSP technology is an extension of the Java Servlet technology. Servlet are platform independent, 100% pure Java server-side modules that fit seamlessly into a web server framework and can be used to extend the capabilities of a web server with minimal overhead, maintenance and support. Unlike other scripting languages, servlet involve no platform-specific consideration or modifications. JSP technology uses XML-like tags and scriptlets written in the Java language to encapsulate the logic that generates the content for the page.

Sun has made JSP specification freely available to the development community, with the goal that every web server and application server will support the JSP interface. JSP pages share the "Write Once, Run Anywhere" characteristic of Java technology.

### 2.7.1.4 Comparison between PHP, ASP and JSP

According to revised AltaVista results on March 4, 2002 contributed by Dan Bodenheimer (saint#sfbay.amherst1.com), the percentage of PHP, ASP and JSP being used in Website development are shown below. Note how PHP's market share has grown!




**Pie Chart 2.1: Comparison Between PHP, ASP And JSP Between Year 2000 And 2002 (Revised AltaVista Results March 4, 2002)**

**Table 2.5 : Comparison Between PHP, ASP And JSP Between Year 2000 And 2002 (Revised AltaVista Results March 4, 2002)**

| | October 12, 2000 | March 4, 2002 | Growth | Share |
|---|---|---|---|---|
| php | 84,296 | 4,409,034 | 5130% | |
| php3 | 49,906 | 2,308,381 | 4525% | |
| phtml | 23,268 | 831,815 | 3475% | |
| **Total PHP** | 157,470 | 7,549,230 | 4694% | 30% |
| **asp** | 3,166,710 | 11,958,185 | 278% | 48% |
| **jsp** | 24,435 | 413,827 | 1594% | 2% |
| **cfm** | 936,223 | 4,950,133 | 429% | 20% |

There are 7 reasons why PHP is being chosen instead of ASP and JSP that are Speed, Superior Memory Management, Tight Integration with MySQL, No Hidden Costs with PHP, Closer to Java/C++ Style of Programming, No Show Stopper Bugs and Cross Platform Migration Strategy. Therefore, PHP is chosen as the system's server side scripting languages because besides all the advantages that mentioned before, it is best to use PHP together with MySQL and Apache server for optimize performance.

### 2.7.2 Client – Side Programming Technology

#### 2.7.2.1 Hypertext Markup Language ( HTML )

Hypertext Markup Language ( HTML ) is the lingua franca for publishing hypertext on the World Wide Web, which is one of the most widely used computer languages in the world ( Devguru, 2001 ). Meanwhile, hypertext transfer protocol ( http ) that we see at the beginning of a web address is the way of exchanging HTML files. The popularity and importance of HTML is due to the fact that it is the coding technology used to publish content on the World Wide Web ( commonly also referred to as the Internet ). It is a standard recommended by the World Wide Web Consortium (W3C ) and adhered to by the major browsers, such as Microsoft's Internet Explorer and Netscape's Navigator. As a conclusion, HTML is the most important language that must be included in every web page.

#### 2.7.2.2 JavaScript

JavaScript is a cross-platform scripting language, which is simple, interpreted and object-oriented. It can be used to add simple interactive behaviors to an HTML page by means of a script of keywords instead into a Web page.

JavaScript is different from Java. It is also not derivative of Java. It lacks of power of a full-featured programming languages, the main roles JavaScript play in the web pages are form validation, responding to input, dialog boxes, using cookies to keep visitor information, date and time information, integrating with Java, basic graphics and dynamic HTML. JavaScript statement can be embedded directly into

HTML page. These statement can be recognize and respond to user events such as mouse clicks, form input and page navigation.

## 2. 8 Consideration of Database Server

### 2.8.1 MySQL

MySQL is an Open Source SQL database management system provided by MySQL AB. Open source means that it is possible for anyone to use and modify. Anybody can download MySQL from the Internet and use it without paying anything. MySQL uses the GPL ( GNU General Public License ) to define what a person may or may not do with the software in different situations. MySQL was originally developed to handle very large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years. Through under constant development, MySQL today offers a rich and very useful set of functions. The connectivity, speed and security make MySQL highly suited for accessing databases on the Internet. The noted technologies and features of MySQL are :

i) Portability

MySQL was written in C and C++ language and has been tested for a broad range of different compilers on various platforms. APIs support for various languages such as C, C++, Eiffel, Java, Perl, PHP, Phyton and Tel.

ii) Performance

To ensure the performance, techniques such as SQL functions implemented through a highly optimized class library, very fast B-tree disk tables with index compression, very fast threaded-based memory allocation system, very fast joins using an optimized one-sweep multi-join and in-memory hash tables which are used as temporary tables are applied in MySQL.

iii) Scalable Architecture

MySQL is very fast, reliable and easy to use. MySQL is a client/server system that consists of a multi-threaded SQL server that supports different back ends, several different client programs and libraries, administrative tools and several programming interfaces (APIs).

iv) Connectivity

Clients may connect to the MySQL server using TCP/IP Sockets, Unix Sockets (UNIX), OR named Pipes (NT). Open Database Connectivity (ODBC) supports Win32 systems.

v) Security

A privilege and password systems that are very flexible, secure and allows host-based verification. Passwords are secured because all password traffic is encrypted when you connect to a server.

### 2.8.2 Microsoft SQL Server 2000

Microsoft SQL Server 2000 is the compact database for rapidly developing applications that extend enterprise data management capabilities to devices. It was build upon the modern, extensible foundation of SQL Server 7.0, a critical release in Microsoft's database lineup and one in which much of the SQL product was both re-architect and rewritten. This version sports improved hardware scalability and supports devices ranging from Windows CE handhelds to eight-way multiprocessor cluster servers. This version also includes native support for XML, 4-node failover support, cascading updates and deletes, improved full text search and the ability to run multiple instances on a single server.

Microsoft SQL Server includes rich support for XML and HTTP. It has availability features to partition load, ensure uptime, advanced management and tuning functionality to automate routine tasks and lower total cost of ownership. Additionally, SQL Server 2000 takes full advantage of Windows 2000, including support for the Active Directory™ service and up to 32 processors and 64 GB of RAM.

Besides providing the necessary enterprise "abilities" for data management and analysis, SQL Server 2000 helps deliver agility. Agility is a characteristic of organizations that can rapidly adapt to changing environments for competitive advantage. By giving beyond simple data storage/retrieval and offering true business intelligence functionality, SQL Server 2000 allows business to understand their data and act decisively on analysis results.

It includes features and technologies that make it :

i) Fully Web-Enabled

SQL Server 2000 provides extensive database programming capabilities built on Web standards. Rich XML and Internet standard support give you the ability to store and retrieve data in XML format easily with built – in store procedures. You can also use XML update grams to insert, update and delete data easily.

ii) Highly Scalable and Reliable

Achieve unparalleled scalability and reliability with SQL Server 2000. With scale up and scale out capabilities, SQL Server meets the needs of demanding e-commerce and enterprise applications.

iii) Deliver Fastest Time-to-Market

SQL Server has long considered the fastest way to build, deploy and manage e-commerce, line of business and data warehousing solutions. Research studies by independent firms have demonstrated not only that SQL Server is easier to use than its primary competitor, but also that it demonstrates significantly lower total cost of ownership.

Based on the result compare between MySQL and Microsoft SQL Server 2000, MySQL is chosen for this system's database server. This is because it is the world's most popular open source database, recognized for its speed and reliability.

## 2.9 Development Web Server

A Web server is a program that, serves the files that form Web pages to Web users ( whose computers contain HTTP clients that forward their requests ). Every computer on the Internet that contains a web site must have a Web Server program. Two leading Web servers are Apache, the most widely installed Web server and Microsoft's Internet Information Server ( IIS ).

### 2.9.1 Apache

Apache remains the king of Web servers despite intense efforts by Microsoft and Netscape to gain dominance in the market. Apache users have come to rely on the server's rock-solid reliability, outstanding performance and rich set of features. The keys to Apache's attractiveness and popularity life instead in the qualities listed above and its extensibility, its freely distributed source code and active user support for the server.

Based originally on NCSA's freely available HTTP server, Apache's features and strengths are too numerous to list. Among the most notable features are its cross-platform support, protocol support ( HTTP/1.1 ), modularity ( API ), security, logging and overall performance and robustness. Apache runs Window (95/98/NT ), OS/2 and all the major variants of UNIX. The server is fully compliant with HTTP/1.1 and supports API and ISAPI ( NT ). Apache distributes a core set of modules that handle everything from the user authentication and cookies to typo corrections in URLs.

Apache's overall security, performance and robustness are unquestionable. Many of the most accessed sites in the world run Apache or Apache derivatives. Public distribution of the source code results in parches for the software are promptly caught and reported. As a result, Apache's large user base has allowed its developers to create a package that is extremely stable and secure and one that is also able to compete more effectively with commercial packages in terms of both raw speed and integrated features.

Despite all of its strengths, Apache certainly is not for everybody. Setup and maintenance of the server are accomplished via command-line scripting tools. Unlike most popular commercial servers, Apache offers neither browser-based maintenance capabilities nor any Graphical User Interface ( GUI ) configuration/administration tools. This is an advantage for some developers, but for others it can translate into higher deployment and maintenance costs, especially if the site's administrators are unfamiliar with the fundamentals of the server. Furthermore, Apache's "user-driven" technical support via newsgroup may not get the job done for more than a few developers. There are, however, several companies that do provide full commercial support but for a price.

Apache's robust design and extensibility, coupled with its freeware status and the availability of its source code to the public, make Apache a good choice for enterprise-level Web sites and for individuals and workgroups that use UNIX or a combination of UNIX and NT platform.

### 2.9.2 Microsoft Internet Information Server

Internet Information Server ( IIS ) is a group of Internet servers ( including a Web or Hypertext Transfer Protocol server and a File Transfer Protocol server ) with new features and additional capabilities for Microsoft's Window NT and Windows 2000 to help Web administrators to create scalable, flexible Web applications.

With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine and support for writing Web-based applications that access databases. Microsoft points out that IIS is tightly integrated with Windows NT and 2000 in a number of ways, resulting in faster Web page serving.

IIS is very user-friendly because it is easy to configure and can be used alone as a Web Server. IIS also guarantees the same security, networking and administration and user functionality because it inherits all Windows NT features. IIS can also help administer secure Websites and to develop and deploy server-intensive Web applications. Other than that, IIS can support a variety of applications such as Virtual Server, connection to ODBC database, Common Gateway Interface ( CGI ), Active Server Page ( ASP ) and Secure Socket Layer.

A major difference between Apache and IIS is their prerequisites. While Apache is available for many UNIX versions, Linux, Windows and OS/2, IIS can run only in the Windows environment. What's more, the latest version of IIS will run only on Windows 2000 server. Therefore, for the system's web server, comparisons are made between Apache server and Microsoft's Information Server (IIS). Apache is chosen as the Web server for Wellness program system. This is because the project is an open source project, while IIS is a product under Microsoft.

**Table 2.6: Major Differences Between Apache And IIS**

| Feature | Apache | IIS |
|---|---|---|
| OS dependency | Unix, Linux, Windows, OS/2 | Windows |
| Hardware platform | Wide range of hardware supported by the different operating systems, including Intel and SPARC. | Those supported by Windows. |

## 2.10 Development Tools

### 2.10.1 Microsoft Visual Interdev

Microsoft Visual Interdev is an integrated development tool for building dynamic web applications accessible by any web browser on any platform. It includes an integrated development environment, database connectivity tools, programmable components, side management and publishing capabilities, a personal web server, content creation tools and more.

Furthermore, Visual Interdev provides a rapid, visual development environment for building ASP. It can easily integrate ActiveX server components written in Visual J++, Visual BASIC, Visual FoxPro and Visual C++. Using Visual Interdev with ActiveX server components, a developer can easily create multi-tier Web application. ActiveX server components provide a convenient and effective way to tightly integrate a Web application with existing Internet system.

Visual Interdev delivers a comprehensive set of tightly integrated database tools for Web developers. The database connectivity features are based on the industry. Standard ODBC including Oracle, Sybase, Microsoft SQL Server, Microsoft Access, Microsoft Visual FoxPro, Informix IBM BM/2 and others. In

addition, using Visual Interdev, a developer can create scalable database solutions because it leverages ASP. The core database components of Microsoft Interdev include Active Data Object (AD0), Integrated Data View, Design Time ActiveX Controls, Database Wizards, Query Designer and so on.

A Visual Interdev project consists of a live Website when developers open a project. They are actually opening a live view of a site, as it exists on the Web server. The IDE is thus a complete Web site management tool that allows the developer to easily modify the structure of a Web site and to edit, add, rename and delete files and folders on the Web sites. It can also open multiple Web sites at the same time.

### 2.10.2 Macromedia Dreamweaver MX 6.0

For this system, Macromedia Dreamweaver MX 6.0 will be used for the web page interface design. It is the professional choice for building websites and Internet applications. It combines its renowned visual layout tools with the rapid web application development features of Dreamweaver UltraDev and the extensive code-editing support of Macromedia HomeSite. Dreamweaver MX now includes the powerful file versioning and administration capabilities of Macromedia Contribute, the tool that lets anyone update and publish content to existing websites without knowing HTML. Macromedia Dreamweaver is a professional HTML editor for designing, coding, and developing websites, web pages, and web applications. Dreamweaver provides helpful tools to enhance web creation experience. The visual editing features in Dreamweaver quickly create pages without writing a line of code. Dreamweaver also includes many coding-related tools and features, including code editing tools.

# CHAPTER 3 : METHODOLOGY

## 3.1 Introduction

This chapter discusses the methodology used to complete this project, reason for choosing the methodology and an overview of each phase in the system development life cycle. In addition, this chapter also includes proposal of tools chosen to develop the system and why those tools are chosen.

## 3.2 Software Process Model

A software development process is a set of ordered task, a series of steps involving activities, constraints and resources that produce an intended output of some kind. In order to achieve that, we need these models. It is essential in many aspects including :

- Crucial to form a common understanding among the team members of the activities, resources and constraints involved in the software development.
- Easier for the development team to detect inconsistencies, redundancies and omissions in the process leading to the final product.
- Models reflect the goals of the development, finding the faults earlier and meeting budget and customer demands

Many software process models are available, each processing its own set of advantages and drawbacks. Here's a summary of the most commonly used models :

### 3.2.1 Comparison of software process models

**Table 3.1 : Comparison of software process models**

| Model | Advantages | Disadvantages |
|---|---|---|
| Waterfall Model | • Easy to explain the progress of software development<br>• Easy to use and systematic<br>• The flow of each process is shown clearly, from process to another<br>• With prototyping, user requirement can easily captured and fulfilled | • No description or insight into how a stage is transferred to another<br>• Does not take into account that requirements might change in the middle of the design stage and other stages-unrealistic |
| V Model | • Inherits the advantages of the waterfall model<br>• Emphasis more on the activity and correctness of the developed software<br>• Earlier stages are 'revisited' or verified again in the later stages to ensure requirements are met | • Not suitable for rapid development of software<br>• No description or insight into how a stage is transferred to another |
| Prototyping Model | • Allows the rapid development of partial or whole system to capture the requirements of the customer<br>• Early detection of possible catastrophes, new issues or requirements | • Quality of the developed software may be compromised when built in a hurry<br>• Long term maintenance are not taken into account<br>• Unclear transition of development stages |
| Spiral Model | • Good overall risk management on every stage of software development<br>• Minimizes all risk on all stages of software development<br>• Increases the quality of software<br>• Software maintenance is considered thoroughly | • Hard to identify the risks accurately and the risk management sometimes takes up a lot of time<br>• Only suitable for large software because it makes little sense to manage risk at all development stages if the developed software is small |

## 3.3 Waterfall Model With Prototyping

For the Wellness Integrated Information System, Waterfall Model with Prototyping had been chosen to coordinate the development. After considering many other models and analyzing the project requirements, this model was chosen because it :

- Allows prototypes to be generated rapidly using flat HTML pages
- Allows the capture of requirements using the prototype
- Has prototype that can be reused during the development
- Is the most clearly and illustrated model
- Is systematic in the flow of development stages
- Scope of project is well understand
- Project risks have been accessed and are considered to be low

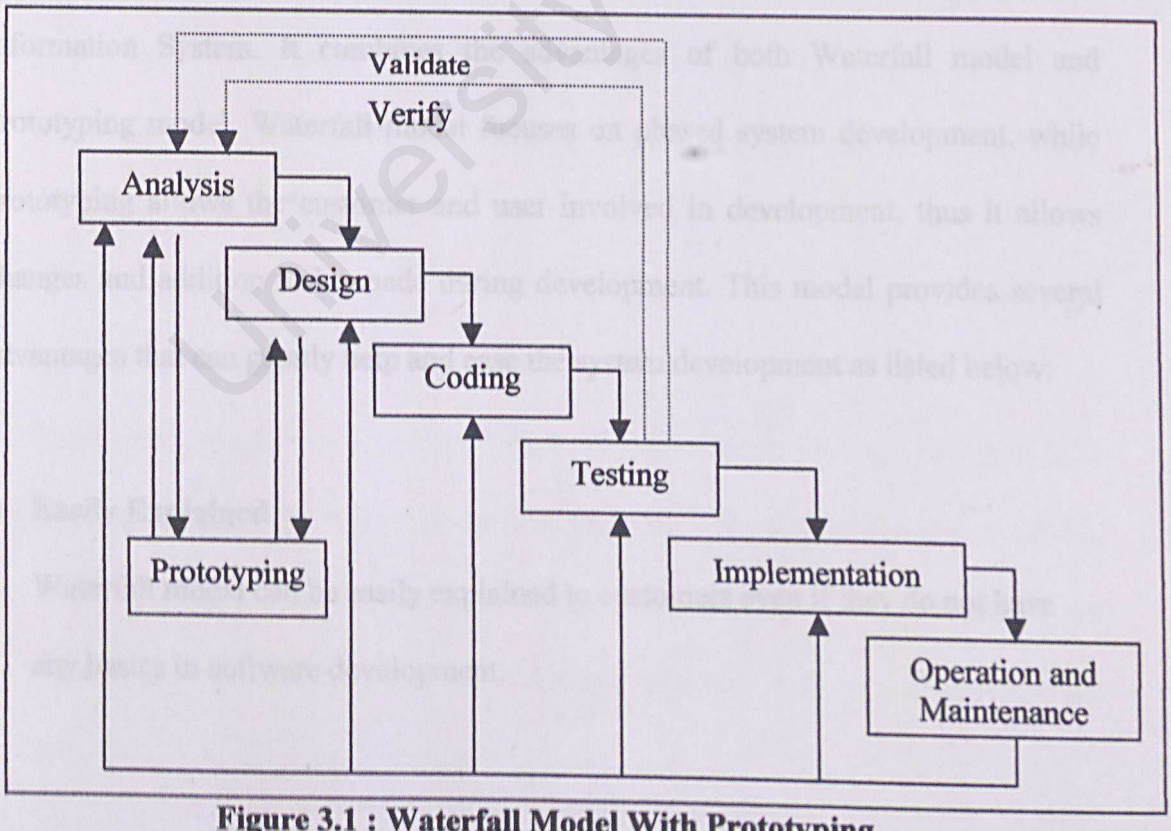



**Figure 3.1 : Waterfall Model With Prototyping**

The project development strategy is a description of the way which this project is done in actuality. The development strategy for this Wellness Integrated Information System with the Waterfall Model with Prototyping will undergo 7 development stages including the Prototyping stage. This is depicted clearly in Figure 3.1. Each development stage should be completed before the next begin. Prototyping development is an idea of developing an initial implementation; expose it to the user for comment and refining it through many versions until an adequate system has been developed. Rather than having separate specifications, development and validation activities, these are carried out concurrently with rapid feedback across these activities.

## 3.4 Advantages Of Choosing The Waterfall Model with Prototyping

The waterfall model with prototyping is chose for the Wellness Integrated Information System. It combines the advantages of both Waterfall model and Prototyping model. Waterfall model focuses on phased system development, while prototyping allows the customer and user involved in development, thus it allows changes and addition to be made during development. This model provides several advantages that can greatly help and ease the system development as listed below:

i) **Easily Explained**

Waterfall model can be easily explained to customers even if they do not have any basics in software development.

ii) **High Level of View**

Waterfall model gives the system developer a high level of view about what is going on in every stage in the development process. It makes explicit which intermediate products are necessary in order to begin the next stage of development. It also suggests to developers the sequence of events they should expect to encounter.

iii) **The Most Basic Model**

The waterfall model is the most basic model. This makes it very easy to learn and use. Besides, more complex models are really just embellishments of the waterfall model, incorporating feedback loops and extra activities.

iv) **Easy Layout**

Software developer can easily layout the whole development process. They can plan exactly what to do in every stage and what is to be needed (milestone) before they can proceed to the following stages. The plan can be layout before the actual project started.

v) **Iteration Is Enabled**

The developer can move back and forth between stages. This can be applied for requirement analysis, system design and program design stages. In the traditional Waterfall model, after the developer moves to a specific stage, they cannot move back to the previous stage and this is not very practical in the actual development process.

vi) **Verification and Validation**

Combining prototyping into Waterfall model enables verification and validation to be made throughout the whole system development process. Customers and developers can also examine some aspects of the proposed system and decide if it is suitable or appropriate for the finished product.

Prototyping is a sub-process and prototype is a partially developed product or a simple simulator of the actual system to examine the proposed system and overview on the functionalities. We hope that the prototype will serve as a foundation that we can build on further later in the coding stages. Prototyping is the success of Wellness Integrated Information System because it ensures the system :

- Meet the performance goals or constraints
- Is practical, scalable and extensible
- Fulfills the documented requirements
- Has an insight of how the model and sub-modules interact with each other.

This stage will be constantly monitored and changed throughout the Requirements Analysis, System Design and Program Design stages. The fundamental activities are based on the six steps which is presented in Figure 3.1 above. The description of each step is discussed below :

1) Analysis

The goal of system analysis is to understand the proposed system and to establish system requirements. The system analysis phase is concerned with data gathering and data analysis.

Data are gathered from sources like interviewing, written materials, Internet as observation and examination of others system. The iterative process of prototyping revision will be Data Flow Diagram ( DFD ). It is chosen to analyze the collected data because it enables the information domain and functional domain to be modeled at the same time. It is graphically to show the flow of the data through the system. The important outcome will be an accurate system requirement specification.

2) Design

The system design phase is the phase in which requirements produced in the previous phase are translated into the representation of the system. This phase will be concerned with user interface design, database and system design.

The iterative process of prototyping-revision is used to revise the design of the user interface. Interface prototypes will be built using web programming languages like JavaScript. Entity Relational ( ER ) modeling will be involved in the logical design of MySQL database. In system design, structure chart will be involve in structuring the system's modules and flow chart might be used to depict the design of procedural details.

3) Coding

This stage translates and implements the detail design representation of the system into programming realization. Scripting languages such as JavaScript,

VBScript and HTML is used in coding the information and functional domain as well as the control of the proposed system. Macromedia Dreamweaver MX 6.0 is the proposed web authoring tool that will be used to create web pages while MySQL will be used to develop the database of the system.

4) Testing

Testing will be a critical step in assuring the quality of the developed system and will represent the ultimate review of specification, design and coding. First, unit testing will be performed to verify each program module. Next, integration testing is performed. It is to integrate unit-tested program and conduct test that uncover error associated with the interfacing of those modules. Validation test succeeds when the system functions in the manner that is reasonably expected.

5) Implementation

The final stage of the development is the system implementation. The system will be implemented on its target software and hardware requirement. The whole system will be revised to uncover the necessity to add further enhancement.

6) Operation and Maintenance

Maintenance process should be an ongoing activity in real development. Monitoring necessary adjustment continue so that the system produces the expected results. However, system enhancements and maintenance will only be carried out in the proposed project if the constraint is allowed.

Activities (2) to (6) are repeated until all the requirements are formalized or until the prototype has evolved into a production system. Therefore, prototype model is selected because it can be created quickly and is relatively inexpensive to build compared to the cost of a conventional system. The system has to be validated and verified during the stage of system testing. The verification is to make sure that the function in the Wellness Integrated Information System project works correctly and to check the quality of the implementation. The validation is to ensure that Wellness Integrated Information System has implemented all the requirements in the specification.

## 3.5 Development Tools

After the great discussion in Chapter 2 : Literature Review, the outline of software tools that need to configure into the development is stated as below :

**Table 3.2 Chosen Development Tools For System Development**

| Description | Software |
|---|---|
| System Architecture | Three-tier Client Server |
| Operating system | Windows 2000 |
| Programming language | PHP, HTML and JavaScript |
| Web Server | Apache |
| Database Server | MySQL |
| System Authoring Tool | Microsoft Frontpage,<br>Macromedia Dreamweaver MX 6.0 |

# CHAPTER 4 : SYSTEM ANALYSIS

## 4.1 Introduction

A good software development practice starts with a good system analysis. Before developing a system, the objective of the system must be understood first, by eliciting the functional and non-functional requirements of the system. After understanding the requirements thoroughly, an analysis is conducted to choose the appropriate tools, architecture, model or techniques to develop a good system. This phase involves all the activities necessary to determine the system requirements. According to Kendall & Kendall, a requirement is a feature of the system or the description of something the system is capable of doing in order to fulfill the system's purpose. Requirements are divided into two categories: functional and non-functional requirements.

## 4.2 Requirement Analysis

The system requirement needs to be drawn out to provide a guideline when developing a system. Therefore, the requirement analysis needs to cover the area of functional requirements and non-functional requirements of the Wellness Integrated Information System.

### 4.2.1 Functional Requirements

A functional requirement describes an interaction between the system and its environment. It also describes how the system should behave when given a certain stimuli.

The system will be approximately divided into 4 different user groups, which are the Wellness Administrator, Committee Members, Participants and Visitors. Each group has their own functions with the related descriptions.

**General Section**

All the modules in the general section are available to all the users of the system without any level restriction. All the users of the system including visitors will be able to access the functions below.

a) Login Module

This module requires information from user to allow them to proceed to the following module.

i) Login

The login process is vital to the system in order to protect its web pages and database from unauthorized users. Users are required to enter their username and password before accessing the system. This will increase the security level of the system.

ii) Change password

Users of the system will have a fixed login name and a changeable password. Users will need to enter their old password and 2 identical new passwords in order to change their old password. Therefore, they can change their passwords regularly for security purposes.

b) Logout Module

This module will logout the members from the system and directs the members back to the main page of the system.

c) Question & Answer Discussion / Forum Board Module

This module is responsible for communicating between users. User can post questions on the board if there are uncertain about the system. Answers may be provided by the Wellness Admin or Committe Members.

d) Information Resources Module

This module is responsible for providing users with information like articles on nutrition, exercises and links to various related site on wellness and health.

e) Search Module

The system will provide a search method for users to find articles related to the keyword(s) that they type in. Users can also search for the questions and answers from the forum that match a particular search criteria.

f) Help Module

This facility is to guide the user in order to help them to surf the system. Help is also provided on solving problems faced when using the search methods. Frequently asked questions (FAQ's) about the site are also included in this module.

g) Notice Board Module

This module is responsible for informing users with announcements and news on medical screening, exercises and various activities related to wellness and health.

**The functional requirements for Administrator are:**

**Table 4.1 : Functional Requirements For Administrator**

| FUNCTIONS | FUNCTIONS DESCRIPTION |
|---|---|
| Input Medical Records | • Administrator can input, delete, edit and view participants medical data records |
| Register / Unregister | • Only administrators can register for the new users or members.<br>• Two types of user are defined :<br>- Committee Members<br>- Participants |
| Manage Log Files | • Wellness Admin can keep track of all the activities in the system by using the log files. Besides, administrator can detect who and when the medical records have been modified. |
| Template Module | • This module allows Wellness Admin to upload the medical |

| | |
|---|---|
| | information such as articles and URL. |
| Manage Notice Board | • This function is used to manage the Notice Board.<br>• Any announcement / news will be displayed here.<br>• The administrator are able to add, delete, and edit any announcement on the Notice Board. |

**The functional requirements for Committee Members are:**

**Table 4.2 : Functional Requirements For Committee Members**

| FUNCTIONS | FUNCTIONS DESCRIPTION |
|---|---|
| View Medical Records | • Committee members can only view participant's medical screening results only with the permission of the Wellness Administrator. |
| Manage Notice Board | • This function is used to manage the Notice Board.<br>• Any announcement / news will be displayed here.<br>• Committee Members are able to add, delete, and edit any announcement on the Notice Board. |

**The functional requirements for Participants are:**

**Table 4.3 : Functional Requirements For Participants**

| FUNCTIONS | FUNCTIONS DESCRIPTION |
|---|---|
| View Medical Records | • Participants can only view their own personal medical screening results. |
| View Notice Board | • Participants can only view the information on the Notice Board displayed by the Administrator and Committee Members.<br>• Any announcement / news will be displayed here. |

**The functional requirements for Visitors are:**

**Table 4.4 : Functional Requirements For Visitors**

| FUNCTIONS | FUNCTIONS DESCRIPTION |
|---|---|
| View visiting area | • Visitors can only view listings of information resources and not the contents of the whole website. Visitors do not have access to medical records stored in the database. |

### 4.2.2 Non-Functional Requirements

A non-functional requirement or constraint describes a restriction on the system that limits the choice for constructing a solution to the problem. These constraints usually narrow the selection of language, platform or implementation technique and tool.

**i) Reliability**

Reliability refers to the ability to rate the failure occurrence of the system, for example the failure of login access. The application systems should be reliable and should not cause unnecessary and unplanned downtime of the overall environment. A system is said to have reliability if it does not produce dangerous or costly failures when it is used in a reasonable manner. This system is using Windows 2000 as its operating systems and Apache server as the systems server, which is now regarded as the best server available. Thus, the system should be reliable enough as long as there is no hardware error on the server or unstable Internet connection

**ii) Portability**

Portability refers to the capability of the system to operate on various platforms regardless of manufacturer or operating systems. Since PHP is the selected server side language, portability is not an issue because PHP is cross platform and can operate on any operating systems. Secondly, the PHP output follows the international standards, which means that all kinds of browser would be able to access the Wellness Integrated Information System.

**iii) Scalability**

Scalability refers to the ability of the system to migrate to a machine with greater or lesser performance ability, without changing much the underlying components. This system is a web-based system; therefore the system can be implemented on almost any machine as long as the minimum requirements are fulfilled.

**iv) Security**

Security refers to the system's immunity to any attacks such as, hacking and malicious codes. User must login with their correct user ID and password to prevent unauthorized access into other user's personal medical details.

**v) Modularity**

Modularity is a key factor in good program design. The working of the system is broken into modules so that distinct functions of objects could be isolated from one another. In the Wellness Integrated Information System, modularity is applied from the beginning as this will lead to easy modification in future and because it is modular in design, other shell modules can be combined or joined easily.

**vi) Usability**

Usability refers to the user-friendliness of the system. The system is quite a large system and covers 4 types of users, which is, the wellness administrator, committee members, participants and the visitors, therefore the user's interface

should be very user-friendly and similar to the existing available websites. A help page will be provided in the website so that it would help users in using the system.

**vii) User Interface**

Wellness Integrated Information System should apply the Graphical User Interface ( GUI ) approach for better visual effects. The usage of suitable and meaningful captions and icons help users to use the system with more confidence.

**viii) Efficiency**

Efficiency in computer technology means a process or procedure that can be called or accessed in an unlimited number of times to produce similar outcomes or output at creditable pace or speed.

**ix) Correctness**

Correctness is the extent to which a program satisfies its specification and fulfills the subscribers' and specialists' mission objectives.

**x) Simplicity**

Forms and screens are kept properly uncluttered in a manner that focuses the users' attention.

**xi) Understandability**

The coding method used, allows other programmers to understand the logic of the program flow.

## 4.3 Development Requirements

### 4.3.1 Development Side Hardware Requirements

The hardware requirements for the system's development environment is as stated in the table below:

**Table 4.5 : Development Side Hardware Requirements**

| | |
|---|---|
| Processor | IBM compatible PC with a Pentium 4 processor or higher |
| Memory | 192 MB RAM or higher (256 MB RAM recommended) |
| Hard Disk | 3.5 GB of hard disk space or higher |
| Monitor | SVGA or other compatible monitor |
| Input devices | Keyboard, mouse or other compatible pointing devices |
| Others | - 3 ½ " floppy disk drive<br>- CD-ROM<br>- Modem and Network Card<br>- Sound Card |

### 4.3.2 Development Side Software Requirements

The software requirements for the system's development environment is as stated in the table below:

**Table 4.6 : Development Side Software Requirements**

| | |
|---|---|
| Authoring Tool | PHP Editor, Macromedia Dreamweaver 6.0 |
| Database Server | MySQL 4.0 |
| Operating System | Windows 2000 Professional |
| Web Browser | Microsoft Internet Explorer 6.0 |
| Web Server | Apache |
| Development Language | PHP (*server-side processing*), JavaScript (*client - side processing*), SQL |

## 4.4 Client-Server System Requirements

### 4.4.1 Client System Requirements

For a client, it is recommended that a reasonable amount of RAM is available, together with a quality dial-up connection line. The recommended software configuration should be at least 64 RAM, minimum 5 MB hard disk, a Windows 2000 operating system and Internet Explorer 6.0 as web browser.

### 4.4.2 Server System Requirements

A minimum of 128MB RAM is suggested but 192MB is more appropriate. This is to make the system run faster since the system need to retrieves information from the database. Implementation of MySQL in a production environment needs at least a Pentium III 800GHz, faster processor speed and more memory for better performance. Hard disk requirement is at least 10 GB and plus with other hardware peripherals. The operating system required will be Windows 2000 with Internet Explorer 6.0 and with MySQL for development.

## 4.5 Summary

In this chapter, the Wellness Integrated Information System functional requirements and non-functional requirements are explained in great details. The justification of system software and hardware requirements for development side, client side and server side are also clearly stated.

# CHAPTER 5 : SYSTEM DESIGN

## 5.1 Introduction

System design is a phase of the waterfall model that the entire requirements for the system are translated into system characteristic. It is also known as the process of transforming the problem into a solution and can be referred as the description of a solution. The description of a system may change during the system development life cycle since the nature of the solution may change as the solution is describe or implemented (Pleeger, 2001). During the design phase of Wellness Integrated Information System, the features and components of the system are specified.

The development of the Wellness Integrated Information System is done using the waterfall model with prototype approach and it is client-server application. The prototype approach allows all or part of the system to be constructed quickly to understand or clarify some issues. Besides, it ensures that the requirements could be fulfilled. By using the prototype approach, the risk and uncertainty could be reduced in the development. System design includes the following issues:

1. System Architecture Design
2. System Functionality Design
3. Database Design
4. User Interface Design

## 5.2 System Architecture

The Wellness Integrated Information System will be using a three-tier formation. This three-tier formation can represent three distinct services provided, the user services, the business services and the database services.

The first tier, which is the client or user tier, is where all applications needed are resided. The browsers will be the applications in this client tiers. Browsers like Internet Explorer and Netscape Navigator are used to display the user interface ( web pages ) to the user of the system. These web pages will have hyper links to enable request from users.

The middle tier is the tier that responsible for providing business services or functionality. This tier will take and gather information that is received from the user and will process this information. Processing of information will conform to the business rules of the requirements identified, encapsulating business logic of the system. The processing will then involve the usage of Apache, which is the application server for the system.

The third tier consists of MySQL as the database server. The database server will be place for repository of important data. The data will be stored in the MySQL and retrieval from the middle tier can be done using the query of the database. The components involve in Wellness Integrated Information System are shown in Figure 5.1

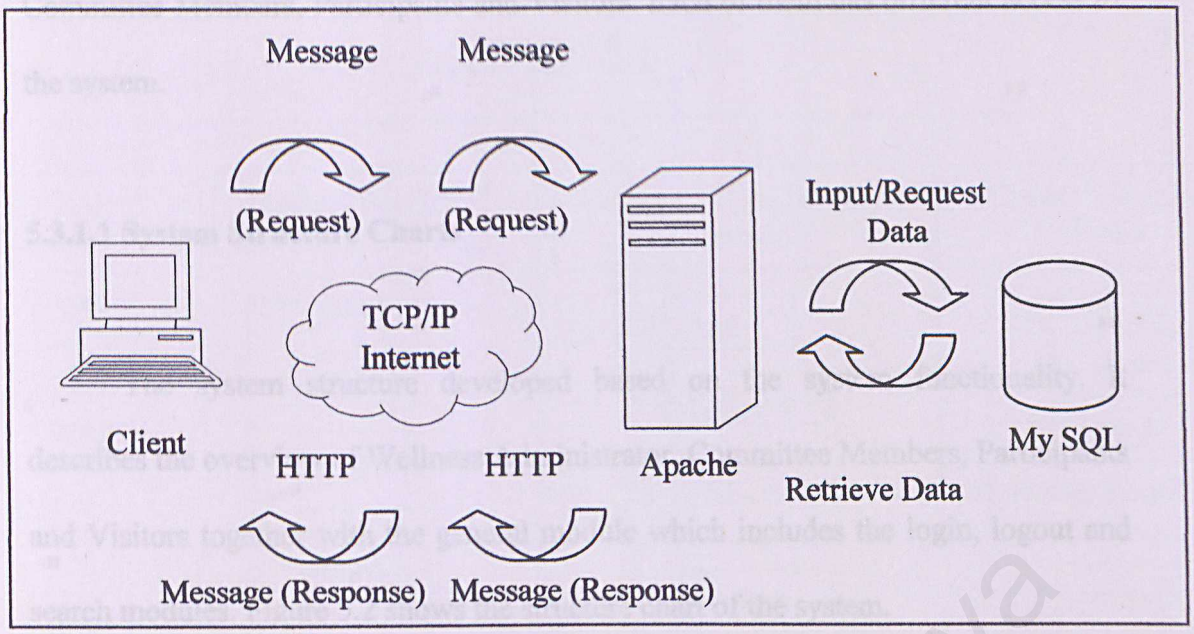



**Figure 5.1: Three-Tier Client/Server System Architecture**

## 5.3 Program Design

During program design, programmers seek to specify the structure and operation of programs that will meet the requirements articulated during the information processing system design phase of system development. Program design transforms all the requirements into an organized picture of the system functionality and data flow diagram.

### 5.3.1 System Functionality Design

System functionality design is based on the system requirements stated in Chapter 4. It translates the system requirement into system functionality. This design focuses on the system structure design and data flow design. The Wellness Integrated Information System is divided into 4 components that are Wellness Administrator,

Committee Members, Participants and Visitors. Each of them has different access to the system.

#### 5.3.1.1 System Structure Charts

The system structure developed based on the system functionality. It describes the overview of Wellness Administrator, Committee Members, Participants and Visitors together with the general module which includes the login, logout and search modules. Figure 5.2 shows the structure chart of the system.

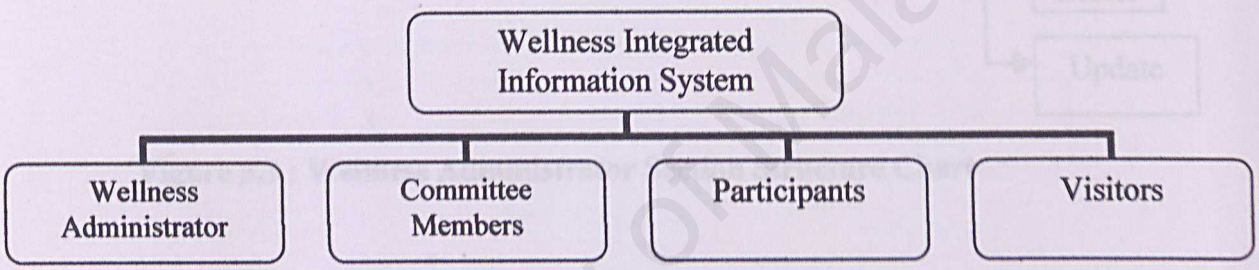



**Figure 5.2 : Wellness Integrated Information System Structure**

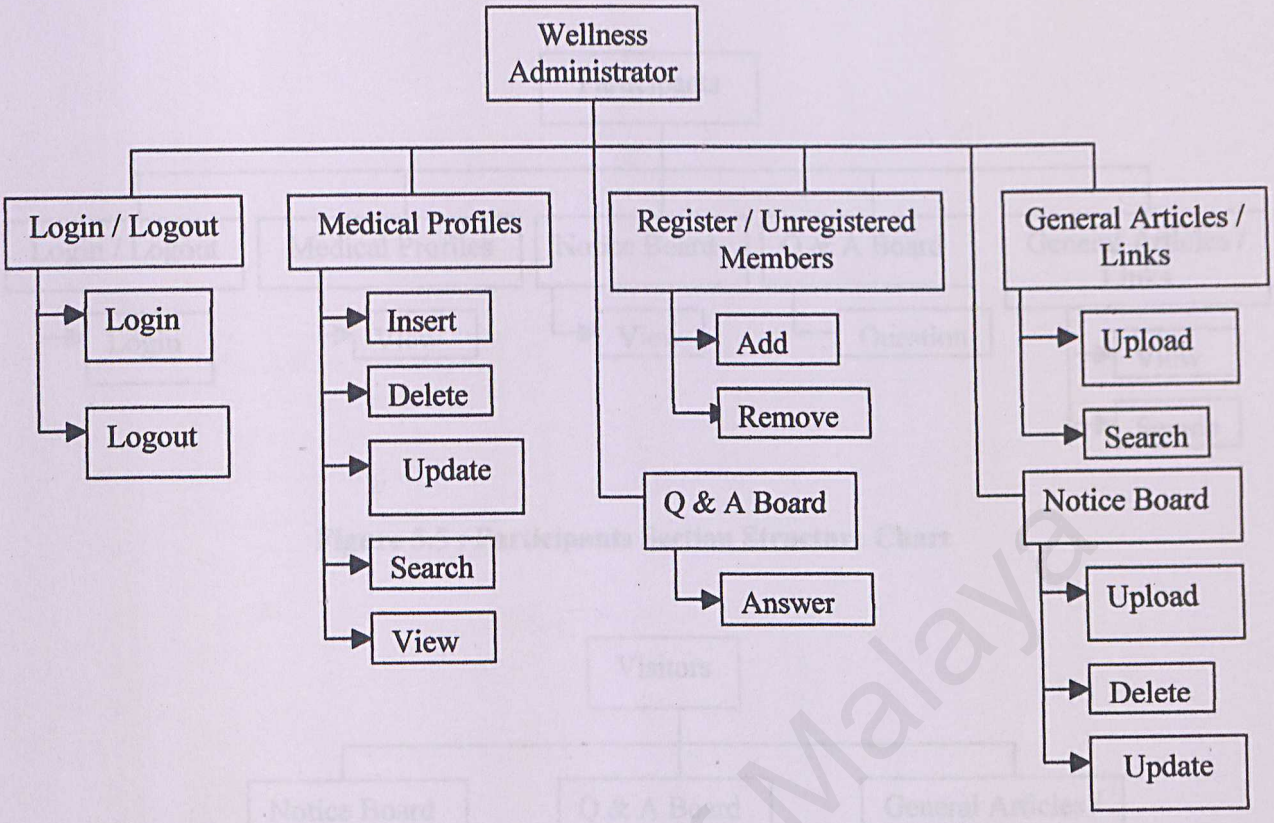



**Figure 5.3 : Wellness Administrator Section Structure Chart**

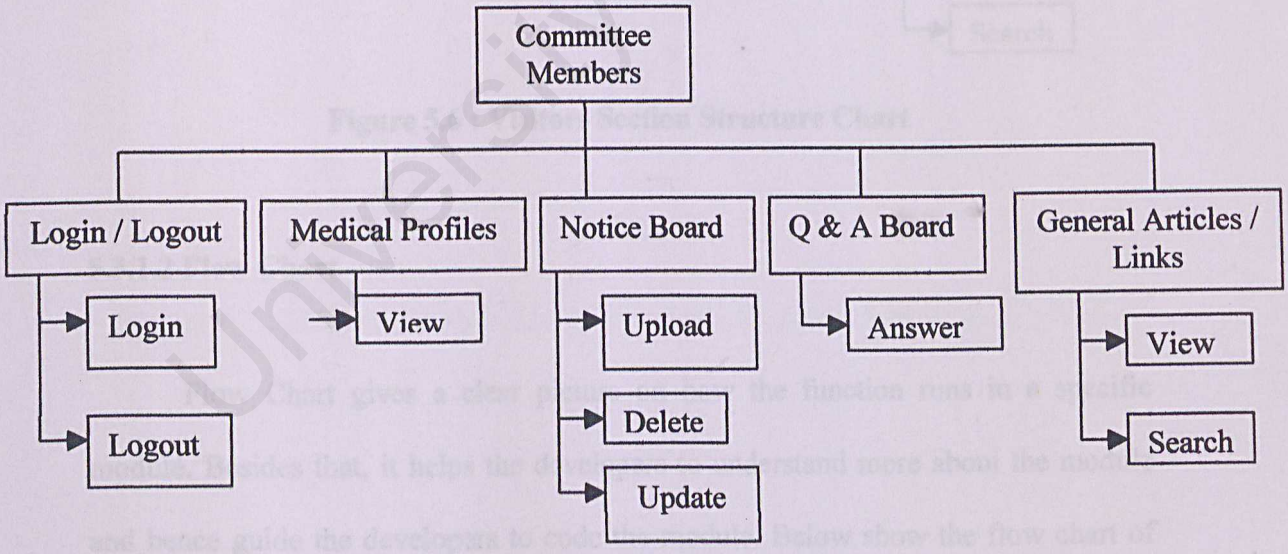



**Figure 5.4 : Committee Members Section Structure Chart**

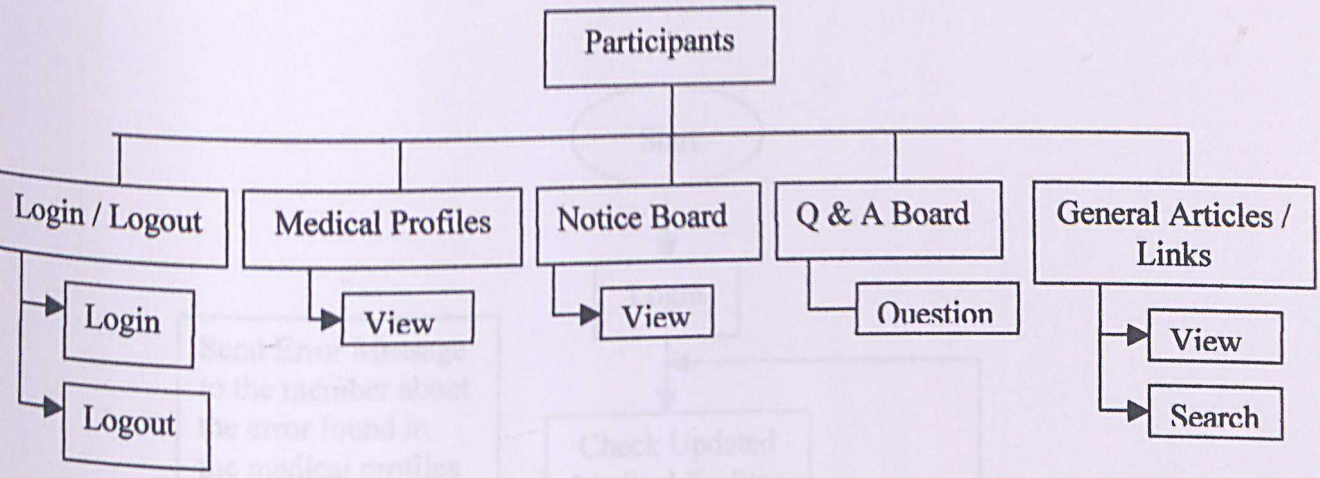



**Figure 5.5 : Participants Section Structure Chart**

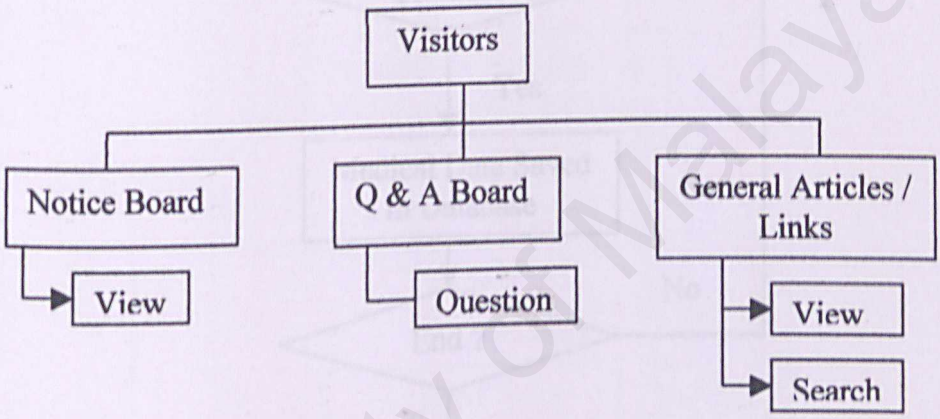



**Figure 5.6 : Visitors Section Structure Chart**

### 5.3.1.2 Flow Chart

Flow Chart gives a clear picture on how the function runs in a specific module. Besides that, it helps the developers to understand more about the module and hence guide the developers to code the module. Below show the flow chart of the template module and medical profiles module in the Wellness Integrated Information System.

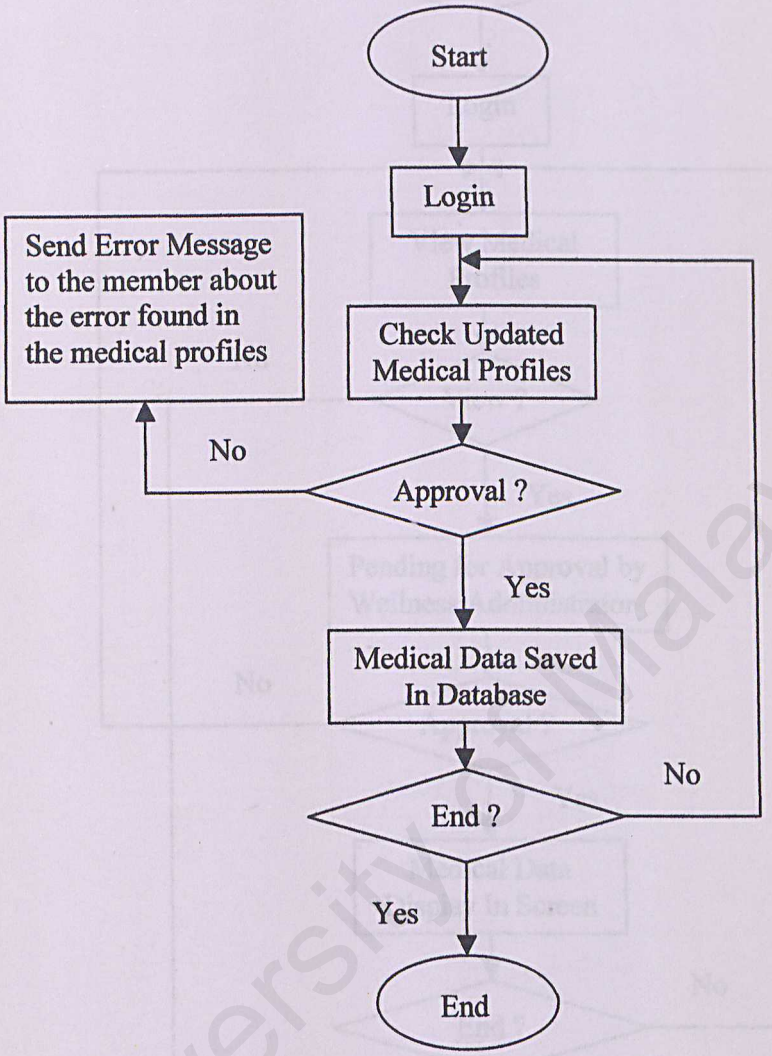



**Figure 5.7 : Medical Profiles Entry Module In Wellness Administrator View**

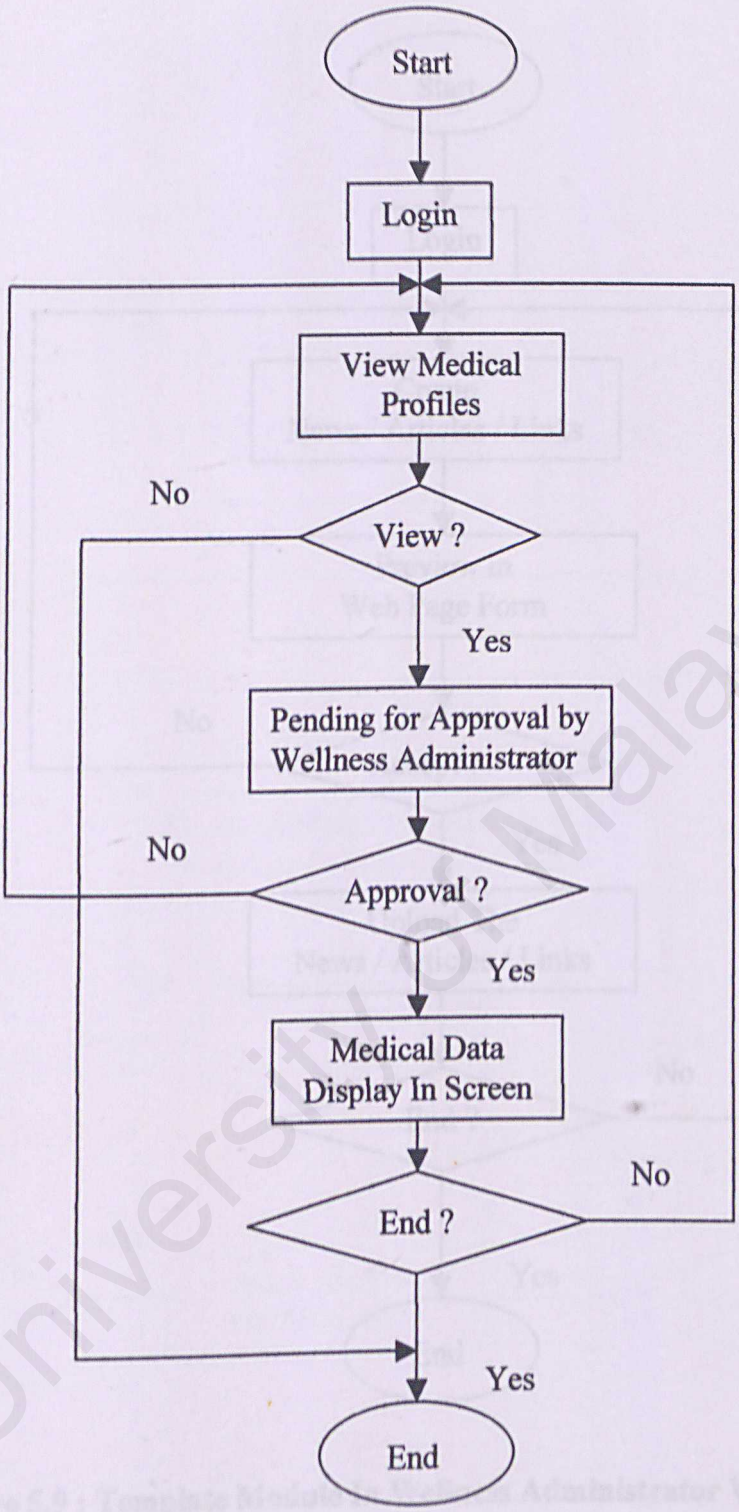



**Figure 5.8 : Medical Profiles View Module In Committee Members View**

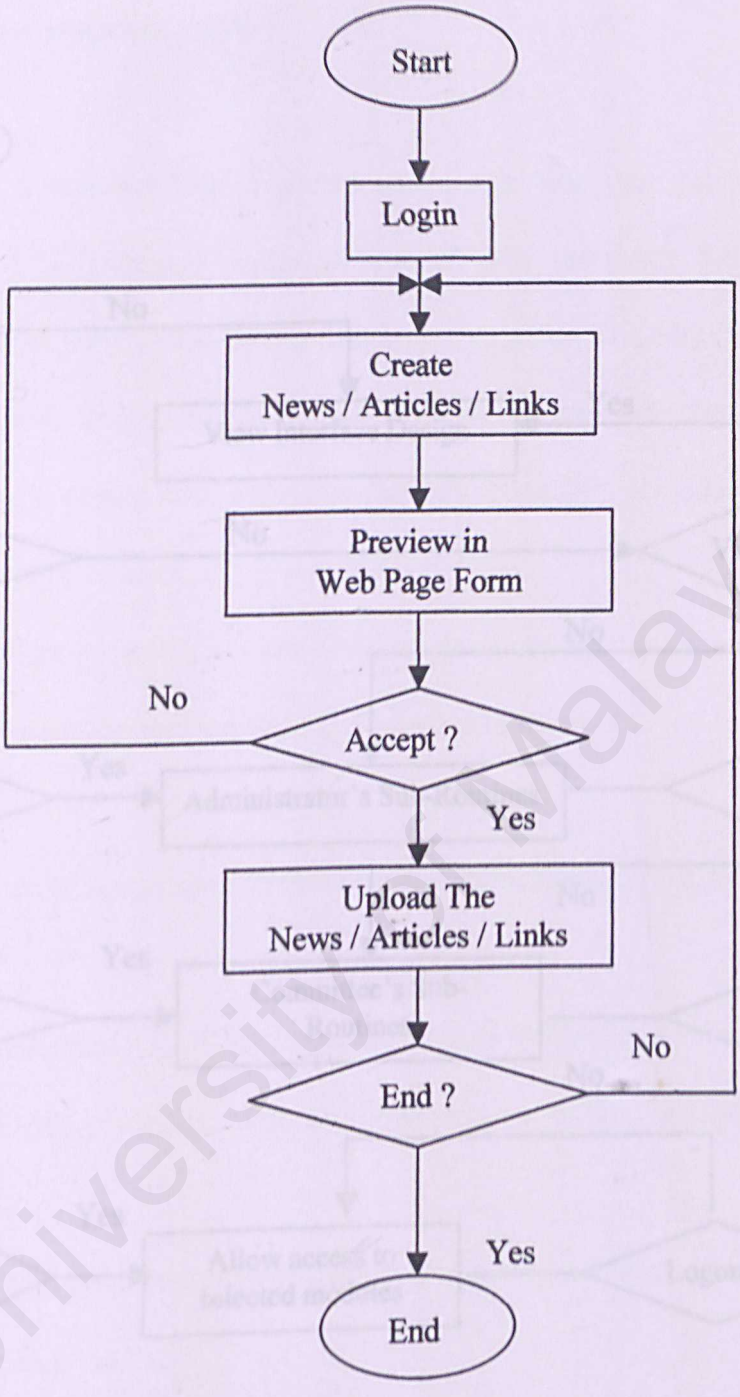



**Figure 5.9 : Template Module In Wellness Administrator View**

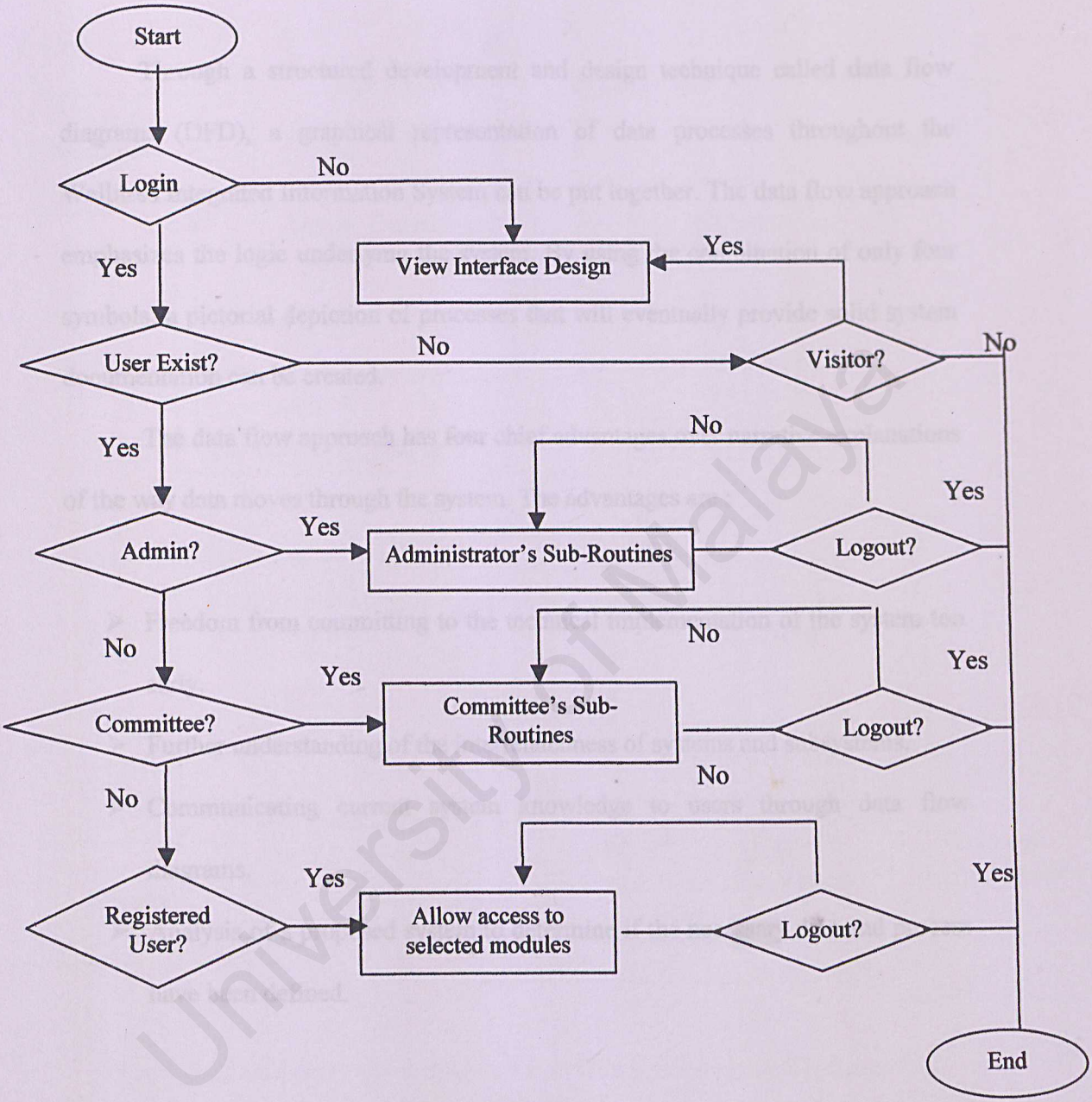



**Figure 5.10 : Security of User Authentication**

### 5.3.1.3 Data Flow Diagram ( DFD )

Through a structured development and design technique called data flow diagrams (DFD), a graphical representation of data processes throughout the Wellness Integrated Information System can be put together. The data flow approach emphasizes the logic underlying the system. By using the combination of only four symbols, a pictorial depiction of processes that will eventually provide solid system documentation can be created.

The data flow approach has four chief advantages over narrative explanations of the way data moves through the system. The advantages are :

- Freedom from committing to the technical implementation of the system too early.
- Further understanding of the interrelatedness of systems and subsystems.
- Communicating current system knowledge to users through data flow diagrams.
- Analysis of a proposed system to determine if the necessary data and process have been defined.

A series of data flow diagrams ( DFDs ) are used to represent the input and output of data and processes throughout the Wellness Integrated Information System. The four basic symbols are used to chart data movement on data flow diagrams. They are a double square, an arrow, a rectangle with rounded corners and an open-ended rectangle ( closed on the left side and open – ended on the right ). An entire

system and numerous subsystems can be depicted graphically with these four symbols in the current combinations.

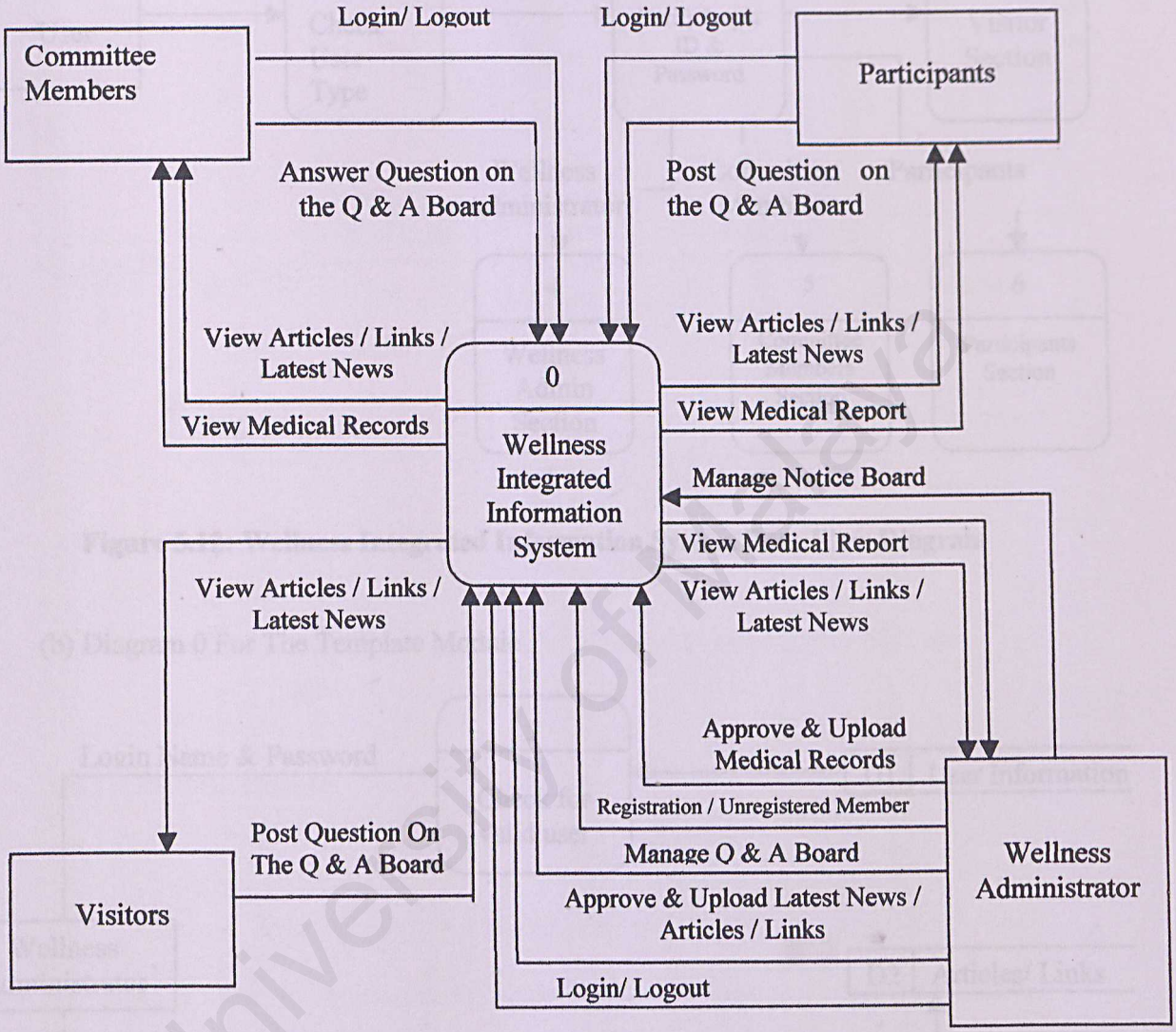



**Figure 5.11 : Context Level Diagram For Wellness Integrated Information System**

(a) Data Flow Diagram For Wellness Integrated Information System

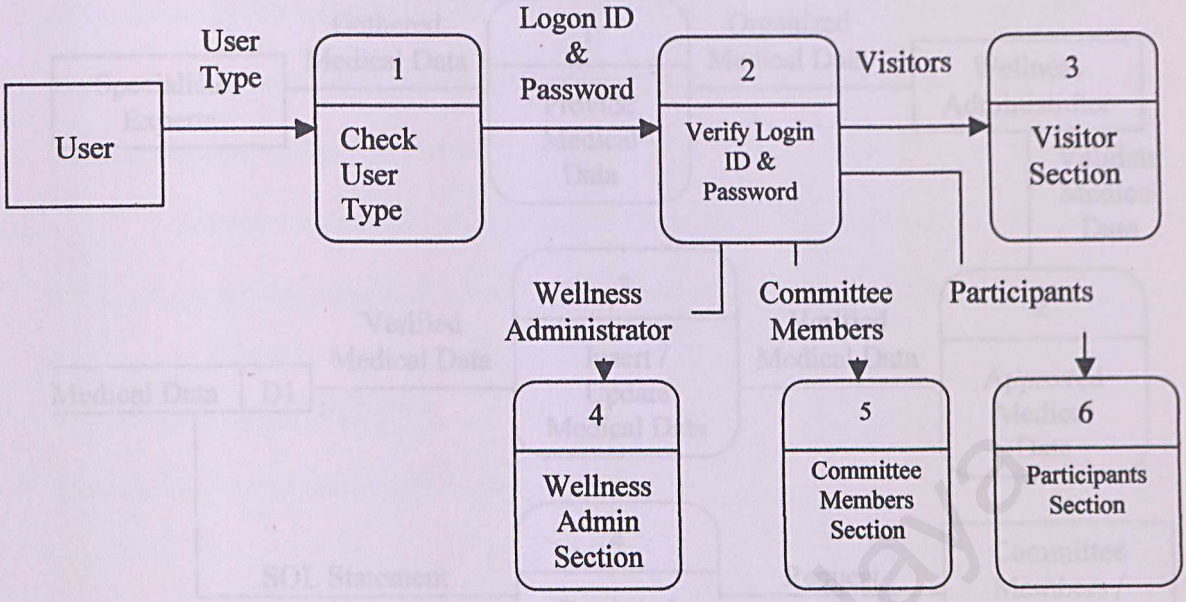



**Figure 5.12: Wellness Integrated Information System Data Flow Diagram**

(b) Diagram 0 For The Template Module

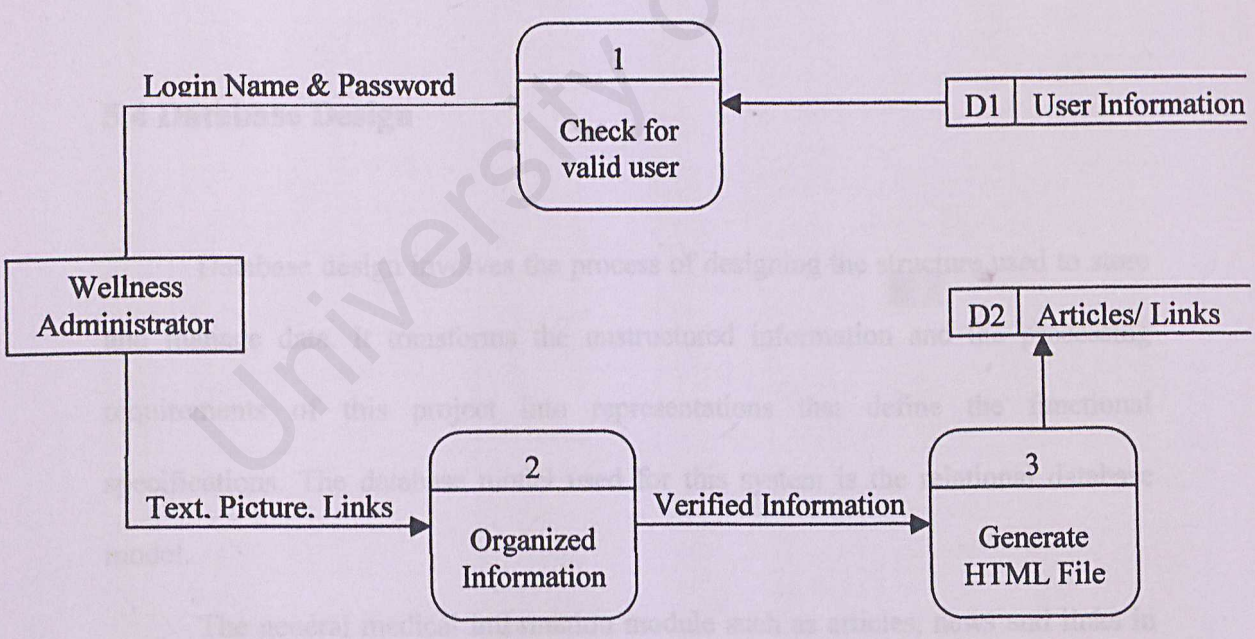



**Figure 5.13: Diagram 0 For The Template Module**

(c) Data Flow Diagram For Medical Profiles Entry Module

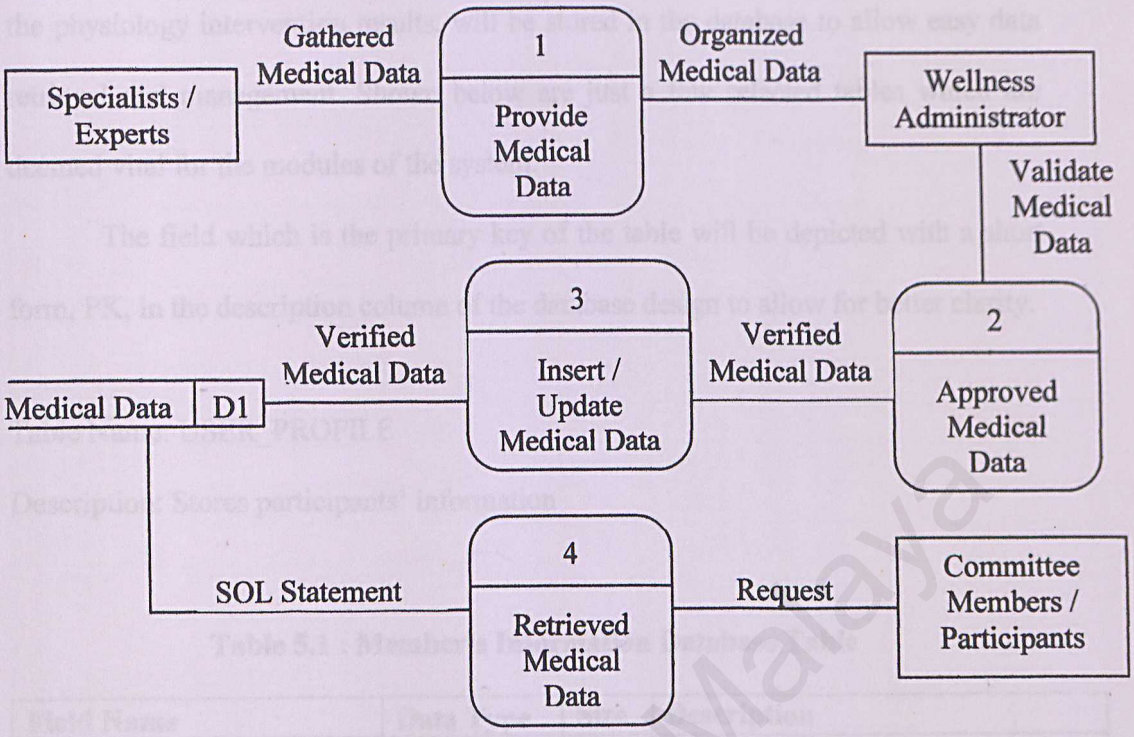



**Figure 5.14: Data Flow Diagram For Medical Profiles Entry Module**

## 5.4 Database Design

Database design involves the process of designing the structure used to store and manage data. It transforms the unstructured information and the processing requirements of this project into representations that define the functional specifications. The database model used for this system is the relational database model.

The general medical information module such as articles, news and links in Wellness Integrated Information System are not involved in database storing. The tables below are the system database design for Wellness Integrated Information System.

All the data collected which include clinical data, questionnaire data and also the physiology intervention results, will be stored in the database to allow easy data retrieval and management. Shown below are just a few selected tables which are deemed vital for the modules of the system.

The field which is the primary key of the table will be depicted with a short form, PK, in the description column of the database design to allow for better clarity.

Table Name: USER_PROFILE

Description: Stores participants' information

**Table 5.1 : Member's Information Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| USER_ID | Varchar | 16 | Unique User ID (PK) |
| FAC_ID | Varchar | 16 | Faculty ID of the user |
| IC_NO | Varchar | 20 | Identity card number |
| REGISTRATION_NO | Varchar | 20 | Registration Number |
| SERIAL_NO | Varchar | 10 | Serial number given for the purpose of Total Wellness Programme |
| LOGIN_NAME | Varchar | 10 | User login name (unique) |
| PASSWORD | Varchar | 100 | Login password (encrypted) |
| FIRST_NAME | Varchar | 40 | User first name |
| LAST_NAME | Varchar | 40 | User last name |
| TITLE | Varchar | 10 | Title of user |
| GENDER | Char | 1 | Male or female |
| TEL | Varchar | 20 | Telephone number |
| EMAIL | Varchar | 100 | Email |
| DOB | Date | - | Date of birth or user |
| ADDRESS_1 | Varchar | 40 | Address 1 of user |
| ADDRESS_2 | Varchar | 40 | Address 2 of user |
| ADDRESS_3 | Varchar | 40 | Address 3 of user |
| ADDRESS_4 | Varchar | 40 | Address 4 of user |
| POSTCODE | Varchar | 10 | Postcode |
| CITY | Varchar | 10 | City |
| STATE | Varchar | 10 | State |
| COUNTRY | Varchar | 20 | Country |
| MARITAL | Varchar | 10 | Marital Status |

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| CHILDREN_NO | Int | 2 | Number of children |
| DESIGNATION | Varchar | 10 | Designation or job post of user |
| OTHER_DESIGNATION | Varchar | 20 | Other than the given selection of designations |
| YR_WORK | Decimal | 20,3 | Years of working experience |
| FIELD01 | Varchar | 100 | Extra field |
| FIELD02 | Varchar | 100 | Extra field |
| FIELD03 | Varchar | 100 | Extra field |
| FIELD04 | Varchar | 100 | Extra field |
| FIELD05 | Varchar | 100 | Extra field |
| FIELD06 | Varchar | 100 | Extra field |
| FIELD07 | Varchar | 100 | Extra field |
| FIELD08 | Varchar | 100 | Extra field |
| FIELD09 | Varchar | 100 | Extra field |
| FIELD10 | Varchar | 100 | Extra field |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: COMMITTEE

Description: Stores Wellness Administrator and Committee member information

**Table 5.2 : Wellness Administrator and Committee Member Information Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| COMMITTEE_ID | Varchar | 16 | Unique committee ID (PK) |
| REGISTRATION_NO | Varchar | 20 | Registration number of committee |
| IC_NO | Varchar | 20 | Identity card number |
| LOGIN_NAME | Varchar | 10 | Login name of committee (unique) |
| PASSWORD | Varchar | 20 | Password |
| FIRST_NAME | Varchar | 50 | First name |
| LAST_NAME | Varchar | 50 | Last name |
| TITLE | Varchar | 10 | Title of the committee |
| ADDRESS_1 | Varchar | 40 | Address 1 |

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| ADDRESS_2 | Varchar | 40 | Address 2 |
| ADDRESS_3 | Varchar | 40 | Address 3 |
| ADDRESS_4 | Varchar | 40 | Address 4 |
| POSTCODE | Varchar | 10 | Postcode |
| CITY | Varchar | 10 | City |
| STATE | Varchar | 10 | State |
| COUNTRY | Varchar | 20 | Country |
| DOB | Date | - | Date of birth |
| GENDER | Char | 1 | Male/Female |
| TEL_HOUSE | Varchar | 20 | House telephone number |
| TEL_OFFICE | Varchar | 20 | Office telephone number |
| TEL_HANDPHONE | Varchar | 20 | Hand phone number |
| EMAIL | Varchar | 100 | Email |
| FIELD01 | Varchar | 100 | Extra field |
| FIELD02 | Varchar | 100 | Extra field |
| FIELD03 | Varchar | 100 | Extra field |
| FIELD04 | Varchar | 100 | Extra field |
| FIELD05 | Varchar | 100 | Extra field |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: FACULTY_DEPT

Description: Stores member's faculty or department information

**Table 5.3 : Faculty or Department Information Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| FAC_ID | Varchar | 16 | Unique faculty or department ID (PK) |
| FAC_NAME | Varchar | 150 | Faculty or department name |
| FIELD01 | Varchar | 100 | Extra field |
| FIELD02 | Varchar | 100 | Extra field |
| FIELD03 | Varchar | 100 | Extra field |
| FIELD04 | Varchar | 100 | Extra field |

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| FIELD05 | Varchar | 100 | Extra field |
| FIELD06 | Varchar | 100 | Extra field |
| FIELD07 | Varchar | 100 | Extra field |
| FIELD08 | Varchar | 100 | Extra field |
| FIELD09 | Varchar | 100 | Extra field |
| FIELD10 | varchar | 100 | Extra field |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: FORUM_QUESTION

Description: Stores the information of posted question of the Q&A Forum

**Table 5.4 : Forum's Question Information Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| QUESTION_ID | Varchar | 16 | Unique forum question ID (PK) |
| SENDER | Varchar | 100 | Name or user name of sender |
| EMAIL | Varchar | 100 | Email of sender |
| MESSAGE | LongtexT | - | Message or question |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |

Table Name: FORUM_ANSWER

Description: Stores the information of posted answer of the Q&A Forum

**Table 5.5 : Forum's Answer Information Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| ANSWER_ID | Varchar | 16 | Unique forum answer ID (PK) |
| QUESTION_ID | Varcher | 16 | Related forum question ID |
| SENDER | Varchar | 100 | Name or user name of sender |
| EMAIL | Varchar | 100 | Email of sender |
| MESSAGE | LongtexT | - | Message or answer |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: NOTICE_BOARD

Description: Stores the information of notices in the system's Notice Board

**Table 5.6 : Notice Board Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| NOTICE_ID | Varchar | 16 | Unique notice ID (PK) |
| NOTICE_TITLE | Varchar | 100 | Title of notice |
| NOTICE_CONTENT | Lngtext | - | Content of notice |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: PHYSIOLOGY_RESULTS

Description: Stores the physiology records of participants

**Table 5.7 : Physiology Records Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| RECORD_ID | Varchar | 16 | Unique physiology record ID (PK) |
| USER_ID | Varchar | 16 | User ID |
| TEST_ID | Varchar | 16 | Test ID |
| BP_SYSTOLE | Decimal | 10, 3 | Blood pressure: Systole |
| BP_DIASTOLE | Decimal | 10, 3 | Blood pressure: Diastole |
| HR_RESTING | Decimal | 10, 3 | Heart rate: when resting |
| HR_STEP_TEST | Decimal | 10, 3 | Heart rate: after step test |
| BODY_WT | Decimal | 10, 3 | Body weight in kg |
| HEIGHT | Decimal | 10, 3 | Height in cm |
| LEAN_WT | Decimal | 10, 3 | Lean weight in kg |
| FAT_WT | Decimal | 10, 3 | Fat weight in kg |
| FLEXIBILITY | Decimal | 10, 3 | Flexibility in cm |
| UPPER_BODY | Decimal | 10, 3 | Upper body in kg |
| LOWER_BODY | Decimal | 10, 3 | Lower body in kg |
| SIT_UP_TEST | Decimal | 10, 3 | Sit up test |
| DATE_OF_TEST | Date | - | Date of test |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

Table Name: PHYSIOLOGY_TEST

Description: Stores the physiology test information

**Table 5.8 : Physiology Records Database Table**

| Field Name | Data Type | Size | Description |
|---|---|---|---|
| TEST_ID | Varchar | 16 | Unique physiology test ID (PK) |
| TEST_NAME | Varchar | 150 | Test name |
| DATE_START | Date | - | Date start |
| DATE_END | Date | - | Date end |
| REMARKS | Longtext | - | Remarks |
| TEST_SUPERVISOR | Varchar | 250 | Name of the test supervisor |
| VENUE | Longtext | - | Venue of test |
| RCTY | Char | 1 | Record type:<br>A – Active (Default)<br>D – Deleted |
| CREATE_BY | Varchar | 10 | Created by user's login name |
| CREATE_DATE | Datetime | - | Date and time created |
| MOD_BY | Varchar | 10 | Modified by user's login name |
| MOD_DATE | Datetime | - | Date and time modified |
| ACCESS_BY | Varchar | 10 | Access by user's login name |
| ACCESS_DATE | Datetime | - | Date and time accessed |

## 5.5 User Interface Design

User interface design describes how software communicates with the human user who uses it (Mundler, 1994). It provides an effective communication medium between a computer and a human in order to get user's input to produce desired output.

As interfaces stand as the representation of a system, the designed input forms, screens and interactive Web fill-in form should meet the objectives as mentioned below:

a) Effectiveness

All the input forms, input screens and fill – in forms will meet the system's objective by serving specific purposes in the Wellness Integrated Information System.

b) Accuracy

Accuracy refers to design that produce proper completion. It ensures correctness of data and the data are up-to-date.

c) Consistency

The proposed Wellness Integrated Information System takes into consideration the consistency of the interfaces to provide user friendliness and easy-to-use features to system users. In this case, consistency is required especially in data grouping which is similar from one application to the next.

d) Simplicity and attractiveness

Simplicity refers to keeping some designs purposely uncluttered in a manner that focuses the user's attention, whereas attractiveness implies that users will enjoy using the input screens, input forms and fill-in Web forms through their appealing design.

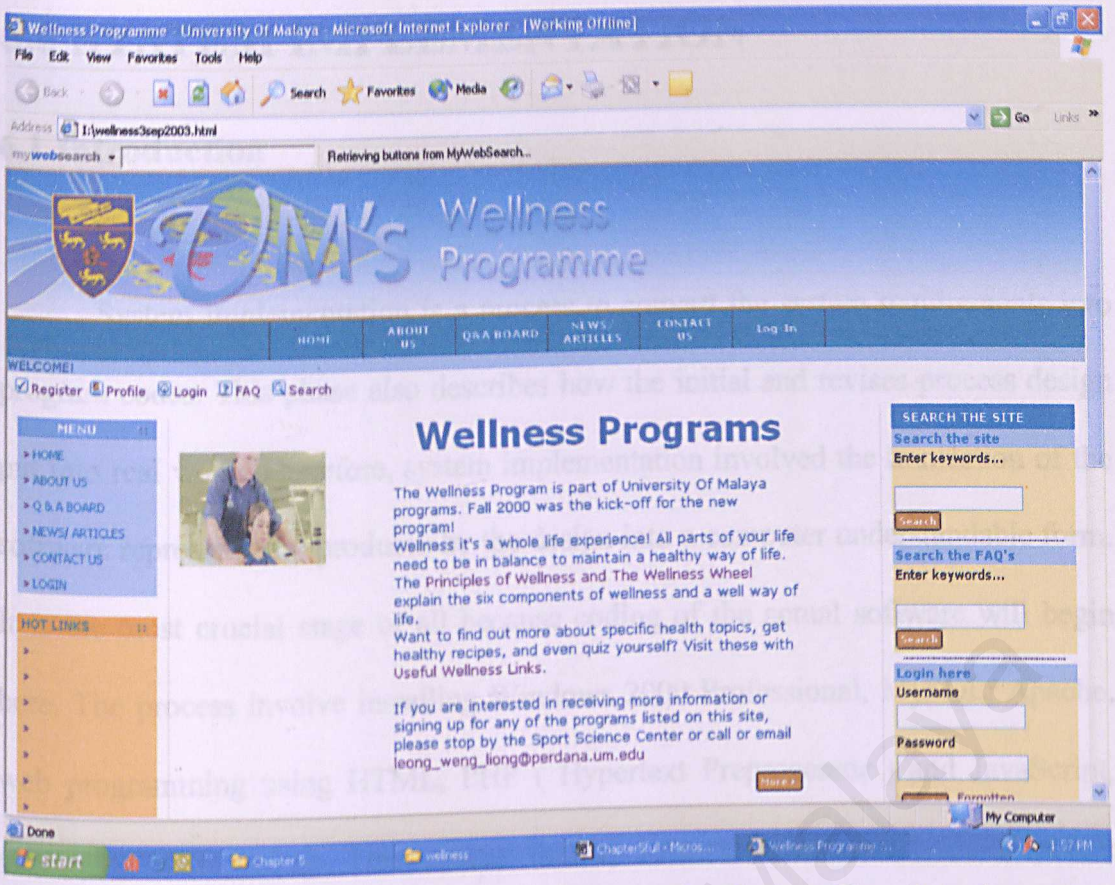



**Figure 5.15 : Wellness Integrated Information System User Interface**

# 6.0 SYSTEM IMPLEMENTATION

## 6.1 Introduction

System implementation is a process to convert the system requirements into program codes. This phase also describes how the initial and revises process design put into real work. Therefore, system implementation involved the translation of the software representation produces by the design into a computer understandable form. It is the most crucial stage of all because coding of the actual software will begin here. The process involve installing Windows 2000 Professional, MySQL, Apache, web programming using HTML, PHP ( Hypertext Preprocessor ) and JavaScript, debugging and testing. This means that it involved the system development environment, program coding and database development. This phase involve some modifications to the previous design. It is also in this stage that all previous design done from the Analysis and Design stage must be implemented correctly and precisely according to its original intentions.

## 6.2 Development Environment

The initial stage of system implementation involves setting up the development environment. Development environment has certain impact on the development of a system. Using the suitable hardware and software will not only help to speed up the software development but also determine the success of the project. Setting up development environment includes setting up development platform, web server, database server and others to facilitate the system

implementation. The hardware and software tool used to develop the entire system is as discussed below :

**Table 6.1 : Development Side Hardware Requirements**

| | |
|---|---|
| Processor | IBM compatible PC with a Pentium 4 processor or higher |
| Memory | 192 MB RAM or higher (256 MB RAM recommended) |
| Hard Disk | 3.5 GB of hard disk space or higher |
| Monitor | SVGA or other compatible monitor |
| Input devices | Keyboard, mouse or other compatible pointing devices |
| Others | - 3 ½ " floppy disk drive<br>- CD-ROM<br>- Modem and Network Card<br>- Sound Card |

**Table 6.2 : Development Side Software Requirements**

| | |
|---|---|
| Operating System | Windows 2000 Professional |
| Web Browser | Microsoft Internet Explorer 6.0 |
| Web Server | Apache |
| Database Server | MySQL 4.0 |
| Graphics and Web Design Tools | Adobe Photoshop 7.0, Adobe Illustartor 1.0 |
| Authoring Tool | PHP Editor, Macromedia Dreamweaver 6.0 |
| Development Language | PHP (*server-side processing)*, JavaScript (*client - side processing)*, SQL |

## 6.3 Development Strategy

Generally, Wellness Integrated Information System is developed using top-down strategy. This approach allows the higher-level modules to be coded first before the lower-level module. Top down design strategy is used because it provides the ability to simplify problems by repeatedly decomposing problems into smaller size. This approach may reduce the problems faced in each development phase and shorten the development time.

In addition, Wellness Integrated Information System is also developed using modular approach where each module or function is developed separately and later integrated into the fully functional system. Some critical programs are coded separately in components and being tested.

## 6.4 Coding Approach

Top-down coding method is selected to code the various module of the Wellness Integrated Information System. Top-down coding method is based on the principle of coding the high-level modules first and leave the lower level modules called in skeleton form, to be filled in later. The lower modules are only a shell, with an entry and an exit. In other words, as the higher module is being coded, references are made to the lower modules as if they are coded an available but in fact, a call to that still-incomplete module will result in an empty action. This approach is used to allow testing to begin on some of the modules while others are still being coded. By using this approach, the most serious types of errors are identified early.

## 6.5 Coding Principle

Several programming principles are applied in coding the program to ensure the consistency, maintainability and readability of the system. They are

i) Indenting, formatting and commenting the code to help to increase the program code readability

ii) Using a variable naming convention consistently to increase the program consistency and maintainability

iii) Documentation of code provide a clear comment guide for understanding during the maintenance phase of software development

iv) Appropriate white space in a written program is necessary to ensure readable programming code.

v) The error handling techniques should be included to trap an error and then handle it gracefully.

## 6.6 Development of Wellness Integrated Information System

Most of the codes in Wellness Integrated Information System are HTML tags, PHP ( Hypertext Preprocessor ) scripts and JavaScript. Briefly, HTML is just used to create the user interface and design for the system. Besides that, JavaScript is used mainly for validation of user input and handles interactive effects of some modules. In order to make the web pages more dynamic as well as to process or execute the request from the user, PHP is the script that is used mostly in Wellness Integrated Information System.

### 6.6.1 Web Page Layout Development

Development stage of the Wellness Integrated Information System involves designing and creating user-friendly web pages. Since the HTML is the standard web-based scripting language that marks up a web page with formatting command, therefore it is used widely in the Wellness Integrated Information System web page layout development. By using HTML, presentable web pages and images have been developed. In addition, HTML is also used to generate forms that enable system to

collect data. For instance, radio button, command button, textbox, checkbox and others component are inserted into the forms to perform specific tasks or functions. Tables are inserted carefully align to suit the outlook of the information and documents. For example, the HTML tag for top menu and left menu is shown in Figure 6.1 below.

```
< !-- Start of Banner -- >
<TABLE cellSpacing=0 cellPadding=0 width="100%" border=0>
        <TBODY>
        <TR>
      <TD background="images/bgtop1.1copy.jpg">
       <TABLE cellSpacing=0 cellPadding=0 width="100%" border=0 >
        <TBODY>
        <TR>
         <TD>
         <IMG
          alt="University of Malaya"
          src="images/top1.2 copy.jpg" width="712" height="127"></TD>
            </TR></TBODY></TABLE></TD>
 </TR>
        <TR>
          <TD background="images/bgbottom1.2abovecopy.jpg">
              <img src="images/bottom1.3above.jpg" >
          </TD>
        </TR>
        <TR>
          <TD>
              <img src="images/bottom1.3below.jpg" width="260"
height="17">
          </TD>
        </TR>
      </TBODY></TABLE>
< !—End of Banner -- >
```

**Figure 6.1 : HTML Table Tag For Top Banner**

### 6.6.2 Program Development

#### a) Client Side Scripting

Besides using HTML, client side scripting such as JavaScript are embedded in the HTML codes for further enhances the functionality of the web pages. In the Wellness Integrated Information System, most of the client side scripting are employed to perform interactive tasks at the client side such as checking form completeness and validate user's input. Client side scripting has been imposed to validate user's login ID and password, particulars, medical information and the email is in the correct format. Most of the JavaScript were used in form processing because it can improve the overall performance of the system by validating each required fields before send to the server for processing. For example, the JavaScript for validating user registration form is shown in Figure 6.2 below.

```
function validateAllRequired(form) { // validates registerForm.php
        var myForm = document.foobar;
        // Login
        if ( myForm.login.value.length <= 0) {
                alert("You MUST submit a valid login name.");
                myForm.login.focus();
                return false;
        }
        // Email
        if ( myForm.email.value.length < 6) {
                alert("You MUST submit a valid email address.");
                myForm.email.focus();
                return false;
        }
        // Password
        if ( myForm.password.value.length < 1) {
                alert("You MUST enter a password.");
                myForm.password.focus();
                return false;
        }
```

```
        // Confirm Password
        if ( myForm.confirmPassword.value.length < 1) {
                alert("You MUST enter a confirming password.");
                myForm.confirmPassword.focus();
                return false;
        }
        // start of firstname
        if ( myForm.firstname.value.length < 2) {
                alert("You MUST enter a first name.");
                myForm.firstname.focus();
                return false;
        }
        // end of firstname
        // start of lastname
        if ( myForm.lastname.value.length < 2) {
                alert("You MUST enter a last name.");
                myForm.lastname.focus();
                return false;
        }
        // end of lastname
return true;
}
```

**Figure 6.2 : JavaScript For Form Validation**

**b) Server Side Scripting**

In Wellness Integrated Information System, server sides scripting, PHP codes were embedded in the HTML scripts to enhance the system functionality. PHP was used to execute the query and logic on the server to produce consistent results regardless the browser used by the client. This is very important as PHP have the capability to pass parameter from one page to other pages. Scripting delimiters <?php ... ?> have to be inserted for the server side execution. Codes located within these delimiters are invisible to the client and are executed in the server. Below are some of the basic PHP codes employed in the Wellness Integrated Information System :

**i) Session Object**

In order to enhance the functionality of the system, the Wellness Integrated Information System has made use of the session object to manipulate data that needs to be shared between different pages. In the Wellness Integrated Information System, each user will be assigned session after the login into the system before they can browse the content and use the services. As a result, session object is used as a system control in the Wellness Integrated Information System to control the system from unauthorized access.

```
<?php
  /* check login script, included in db_connect.php. */
  session_start();                    //starts a new session

  /* Here we check if username or password session exists or not if it dosen't then
     we set the logged_in variable to 0 and return to our previous called program
 */
  if (!isset($_SESSION['LOGIN_NAME']) || !isset($_SESSION['PASSWORD']))
  {
     $logged_in = 0;
     return;
  }
 else    {
     // remember, $_SESSION['password'] will be encrypted.
     if(!get_magic_quotes_gpc())
     // This gets the current active config of magic quotes. GPC means
GET/POST/Cookie.
     {
        $_SESSION['LOGIN_NAME'] = addslashes($_SESSION['LOGIN_NAME']);
      // addslashes to session username before using in a query.
     }
     $pass = "SELECT PASSWORD,LEVEL FROM user_profile
              WHERE LOGIN_NAME  = '".$_SESSION['LOGIN_NAME']."'";
     $result = mysql_query($pass);
     $num_row = mysql_fetch_row($result);
     If (!($num_row))     {
        $logged_in = 0;
        unset($_SESSION['LOGIN_NAME']);
        unset($_SESSION['PASSWORD']);
                    unset($_SESSION['LEVEL']);
        // kill incorrect session variables.
     }
```

```
    $db_pass = mysql_fetch_array($result);
    /* now we have encrypted pass from DB in
    $db_pass['password'], stripslashes() just incase: */
    $db_pass['PASSWORD'] = stripslashes($num_row[0]);
    $_SESSION['PASSWORD'] = stripslashes($_SESSION['PASSWORD']);
    $_SESSION['LEVEL'] = stripslashes($_SESSION['LEVEL']);
    //compare:
    if($_SESSION['PASSWORD'] == $db_pass['PASSWORD'])    {
      // valid password for username
      $logged_in = 1; // they have correct info session Variables.
    }
    else    {
      $logged_in = 0;
      unset($_SESSION['LOGIN_NAME']);
      unset($_SESSION['PASSWORD']);
      unset($_SESSION['LEVEL']);
      // kill incorrect session variables.
    }
  }    // clean up
      unset($db_pass['PASSWORD']);
      unset($db_pass['LEVEL']);
?>
```

**Figure 6.3 : PHP Code For Sessions Object**

**ii) Check User Access**

```
<?php
  /* database connect script. */
  require 'include/db_connect.php';
  if($logged_in = = 1)    {    // already logged in
      require_once("redirect_alreadylogin.php");
      exit();
  }
  if (isset($_POST['submit']))
  {   // if form has been submitted
    /* check they filled in what they were supposed to and authenticate */
    if(!$_POST['uname'] | !$_POST['passwd'])   {   // did not fill in a required field
       require_once("redirect_login.php");
       exit();
    }  // authenticate.
  if (!get_magic_quotes_gpc())    {
      $_POST['uname'] = addslashes($_POST['uname']);
    }
    $check = "SELECT LOGIN_NAME, PASSWORD, LEVEL, USER_ID
        FROM user_profile WHERE LOGIN_NAME = '".$_POST['uname']."'";
    $result = mysql_query($check);
    $num_rows = mysql_num_rows($result);
```

```
    if (!($num_rows)) {      // username does not exist in our database
       require_once("redirect_login.php");
       exit();
    }

    $info = mysql_fetch_Array($result);
    $_SESSION['USER_ID'] = stripslashes($info['USER_ID']);
    $_SESSION['LEVEL'] = stripslashes($info['LEVEL']);
    // check passwords match
    $_POST['passwd'] = stripslashes($_POST['passwd']);
    $info['PASSWORD'] = stripslashes($info['PASSWORD']);
    $_POST['passwd'] = base64_encode($_POST['passwd']);
    if ($_POST['passwd'] != $info['PASSWORD'])    {     //   Incorrect password
       require_once("redirect_login.php");
       exit();
    }
        /* if we get here username and password are correct,
    register session variables and set last login time.*/
    $date = date('m d, Y');
    $update_login = mysql_query("UPDATE user_profile
                        SET ACCESS_DATE = '$date'
                        WHERE LOGIN_NAME = '".$_POST['uname']."'");
    $_POST['uname'] = stripslashes($_POST['uname']);
    $_SESSION['LOGIN_NAME'] = $_POST['uname'];
    $_SESSION['PASSWORD'] = $_POST['passwd'];

    // Remember Me cookie will be set after successful login
    if (isset($_POST['remember_me'])) {
       $time_expire = time()+31536000;
       setcookie("uname", $_POST['uname'], $time_expire);
       setcookie("passwd", md5($_POST['passwd']), $time_expire);
    }
?>
<?php
       if ((isset($_SESSION['LEVEL'])) && ($_SESSION['LEVEL']==3)) {
             header("Location: admin/index.php");

       }
       if ((isset($_SESSION['LEVEL'])) && ($_SESSION['LEVEL']==2)) {
             header("Location: committee/index.php");

       }
       if ((isset($_SESSION['LEVEL'])) && ($_SESSION['LEVEL']==1)) {
             header("Location: member/index.php");

        }
?>
```

**Figure 6.4 : PHP Code For Checking User Access**

**iii) Article Management**

```
<?php

// ------------------------------------------------------
//  Articles search
// ------------------------------------------------------
if($action == "search" || $action == "") {

print "<blockquote><p class=\"PAGEHEADING\">Admin: Search for Articles";
?>

<P><A HREF="am.php">Main Menu</A> | <A
HREF="articles.php?action=add">Add an Article</A>
<?php
//$authors = mysql_query("SELECT name FROM article_authors;");
$cats    = mysql_query("SELECT id, name FROM article_cats WHERE RCTY = 'A'
ORDER BY name;");
?>

<FORM ACTION="articles.php?action=list" METHOD=POST>
<P><b>View articles satisfying the following criteria:</b><BR><br>
<table border=0 cellpadding=5>
<tr><td>

By Category:
</td><td>
<SELECT NAME="cid" SIZE=1>
 <OPTION SELECTED VALUE="">Any Category
<?php
 while ($cat = mysql_fetch_array($cats)) {
  $cid = $cat["id"];
  $cname = $cat["name"];
  echo("<OPTION VALUE='$cid'>$cname\n");
 }
?>

</SELECT>
</td></tr><tr><td>
Containing Text:
</td><td><INPUT TYPE=TEXT NAME="searchtext">
</td></tr><tr><td>   </td><td>
<INPUT TYPE=SUBMIT NAME="submit" VALUE="Search">
</td></tr></table>
```

```
// ------------------------------------------------------
//  Add an article
// ------------------------------------------------------
if($action == "add") {
print "<blockquote><p class=\"PAGEHEADING\">Admin: Add an Article";
print "<P><A HREF=\"am.php\">Main Menu</A> | <A
HREF=\"articles.php?action=search\">Search for Articles</A></P>";

if ($submit) {
        if ($cid == "") {
                echo("<P>You must choose a categori " . "for this article. Click
                'Back' " . "and try again.</P>");
  exit();
 }
 mysql_select_db("wellness");

 $sql = "INSERT INTO articles SET " .
         "title='$title', " .
         "description='$description', " .
         "content='$content', " .
         "authname='$authname', " .
         "authemail='$authemail', " .
         "datecreated='$datecreated', " .
         "CREATE_BY='".$_SESSION['LOGIN_NAME']."', " .
         "CREATE_DATE='$todaysDate', " .
         "MOD_BY='".$_SESSION['LOGIN_NAME']."', " .
         "MOD_DATE='$todaysDate', " .
         "ACCESS_BY='".$_SESSION['LOGIN_NAME']."', " .
         "ACCESS_DATE='$todaysDate', " .
         "cid='$cid'" ;

 if (mysql_query($sql)) {
  echo("<P>New article added</P>");
 } else {
  echo("<P>Error adding new article: " .
     mysql_error() . "</P>");
 }
// ------------------------------------------------------
//  Delete an article
// ------------------------------------------------------
if($action == "del") {
print "<blockquote><p class=\"PAGEHEADING\">Admin: Delete Article";
print "<P><A HREF=\"am.php\">Main Menu</A> | <A
HREF=\"articles.php?action=search\">Search for Articles</A> </P>";

// Delete all article lookup entries for the article along with the entry for the article.
$ok2 = mysql_query("UPDATE articles SET RCTY='D',
                MOD_BY='".$_SESSION['LOGIN_NAME']."',
                MOD_DATE='$todaysDate',
                ACCESS_BY='".$_SESSION['LOGIN_NAME']."',
                ACCESS_DATE='$todaysDate' WHERE id=$id");
```

```
if ($ok2) {
  echo("<P>Article deleted successfully!</P><br>");
} else {
  echo("<P>Error deleting article from database!<BR>".
      "Error: " . mysql_error() . "<br>");
}
}
```

**Figure 6.5 : PHP Code For Article Management**

**iv) Uploading Files**

```
<?php
// ------------------------------------------------------
//  Upload a file
// ------------------------------------------------------
 $flag = 1;

 // $userfile is where file went on webserver
 $userfile = $HTTP_POST_FILES['userfile']['tmp_name'];

 // $userfile_name is original file name
 $userfile_name = $HTTP_POST_FILES['userfile']['name'];

 // $userfile_size is size in bytes
 $userfile_size = $HTTP_POST_FILES['userfile']['size'];

 // $userfile_type is mime type e.g. image/gif
 $userfile_type = $HTTP_POST_FILES['userfile']['type'];
 $userfile_time = date ("d/m/Y   (l) G:i s");

 // $userfile_error is any error encountered
 $userfile_error = $HTTP_POST_FILES['userfile']['error'];
 if ($userfile_error > 0)
 {
  echo 'Problem: ';
  switch ($userfile_error)
  {
   case 1:  echo 'File exceeded upload_max_filesize';  break;
   case 2:  echo 'File exceeded max_file_size';  break;
   case 3:  echo 'File only partially uploaded';  break;
   case 4:  echo 'No file uploaded';  break;
  }
  exit;
 }
// put the file where we'd like it
 $upfile = '../uploads/'.$userfile_name;
// is_uploaded_file and move_uploaded_file added at version 4.0.3
```

```
        if (file_exists("$upfile")) {

    echo "<SCRIPT>result=confirm(\"Overwrite '$userfile_name'?\");
          if(!result) history.go(-1); </SCRIPT>";

    $flag = 0;

  }
if (is_uploaded_file($userfile))
 {
   if (!move_uploaded_file($userfile, $upfile))
   {
     echo 'Problem: Could not move file to destination directory';
     exit;
   }
 }
 else
 {
  echo 'Problem: Possible file upload attack. Filename: '.$userfile_name;
  exit;
 }
if( $flag ==0) {

 $url = "../uploads/$userfile_name";
 echo "File <b>$userfile_name</b> overwrite successfully<br /><br />";

$query = "INSERT INTO upload SET " .
            "ARTICLE_TITLE='$userfile_name', " .
            "ARTICLE_SIZE='$userfile_size', " .
            "ARTICLE_TYPE='$userfile_type', " .
            "ARTICLE_PATH='$url', " .
            "CREATE_BY='".$_SESSION['LOGIN_NAME']."', " .
            "CREATE_DATE='$todaysDate', " .
            "MOD_BY='".$_SESSION['LOGIN_NAME']."', " .
            "MOD_DATE='$todaysDate', " .
            "ACCESS_BY='".$_SESSION['LOGIN_NAME']."', " .
            "ACCESS_DATE='$todaysDate'" ;
}
```

**Figure 6.6 : PHP Code For Uploading Files**

### 6.6.3 Database Development

In the Wellness Integrated Information System, all the related database tables will be created by specifying all the fields for each table and the field's property

using MySQL. After the creation of all the database tables, appropriate data or information will be inserted into some of these database tables to initialize the system. Furthermore, relationship between tables establishes after the table being created to enforce referential integrity. The referential integrity is an important constraint on a relationship that ensures consistency between related tables. Shown below is the example for database connection.

```
<?php
$db_user = 'e_novative';              // db username
$db_pass = 'e_novative';          // db password
$db_host = 'localhost';           // Usually "localhost"
$db_name = 'wellness';                // db name
$con= @mysql_connect("$db_host","$db_user","$db_pass")
        or die ("Cannot connect to MySQL.");
$db = @mysql_select_db("$db_name",$con)
        or die ("Cannot select the $db_name database. Please check your
        details in the database connection file and try again");
?>
```

**Figure 6.7 : PHP Code For Database Connection**

## 6.7 Debugging

Debugging is an activity to find and fix bugs in the system. If the system does not have any error, it did not mean that it is free of bugs. There are various types of errors that exist in the system such as compile error, run-time error and logic error. The debugger used for the development of Wellness Integrated Information System is mainly the Internet Explorer browser. When an error occurs, the browser will display an error type and notify which file and which line of the program that has error. Figure below shows one of the examples of error messages.

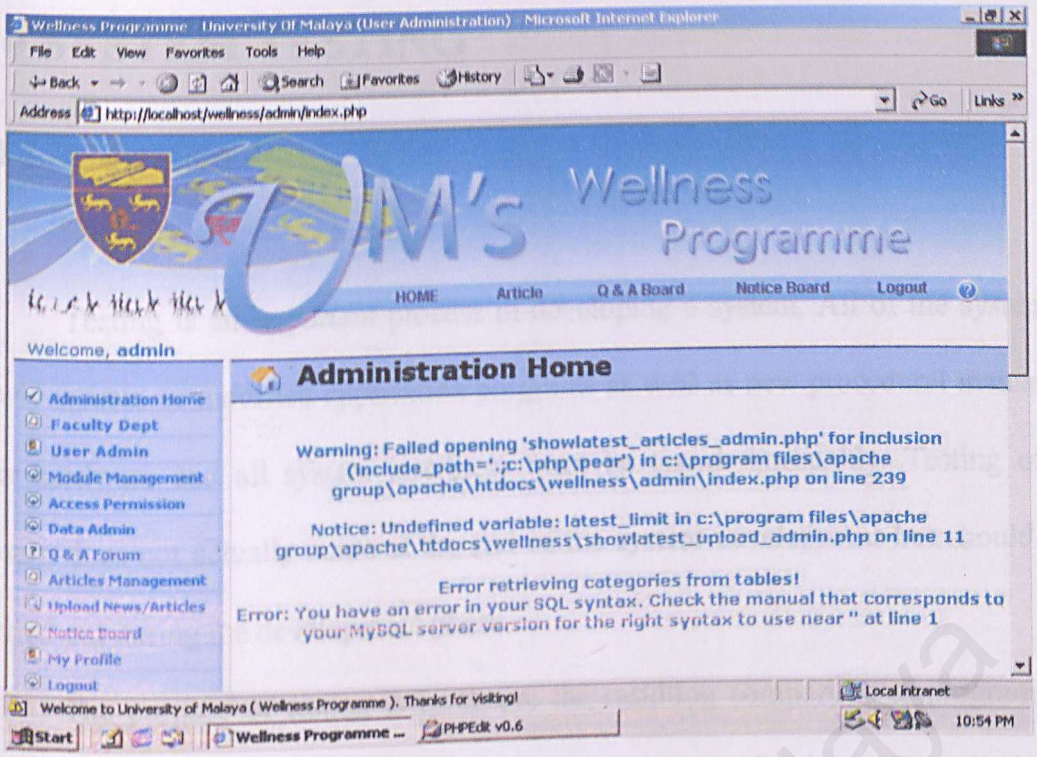



**Figure 6.8 : PHP Code Error**

## 6.8 Conclusion

Chapter 6 presents the system implementation in terms of the coding approach, coding principle and developing coding for Wellness Integrated Information System. With all the software and components, the process of developing the system becomes more easy and effective. Moreover, good programming skills such as using meaningful naming for variables and inserting comment together with codes are important to make the process of implementation more easy and systematic.

# 7.0 SYSTEM TESTING

## 7.1 Introduction

Testing is an important process in developing a system. All of the system's newly written or modified application programs as well as new procedural manuals, new hardware and all system interfaces must be tested thoroughly. Testing of a system does not actually come at the end of the system development but should be carried out during the development phase.

The purpose of testing is to ensure the resulting component of program as well as the whole program to fulfill the requirement specification and to eliminate faults in the program. Due to the errors that occurred during the system development or system design, may result in faults and failures. Therefore, the main idea of testing is to demonstrate correctness of the program, identify the errors in the system coding or the system design. The faults that are discovered during the testing procedures will be corrected.

## 7.2 Testing Process

In general, the testing process of Wellness Integrated Information System can be shown in the following figure:

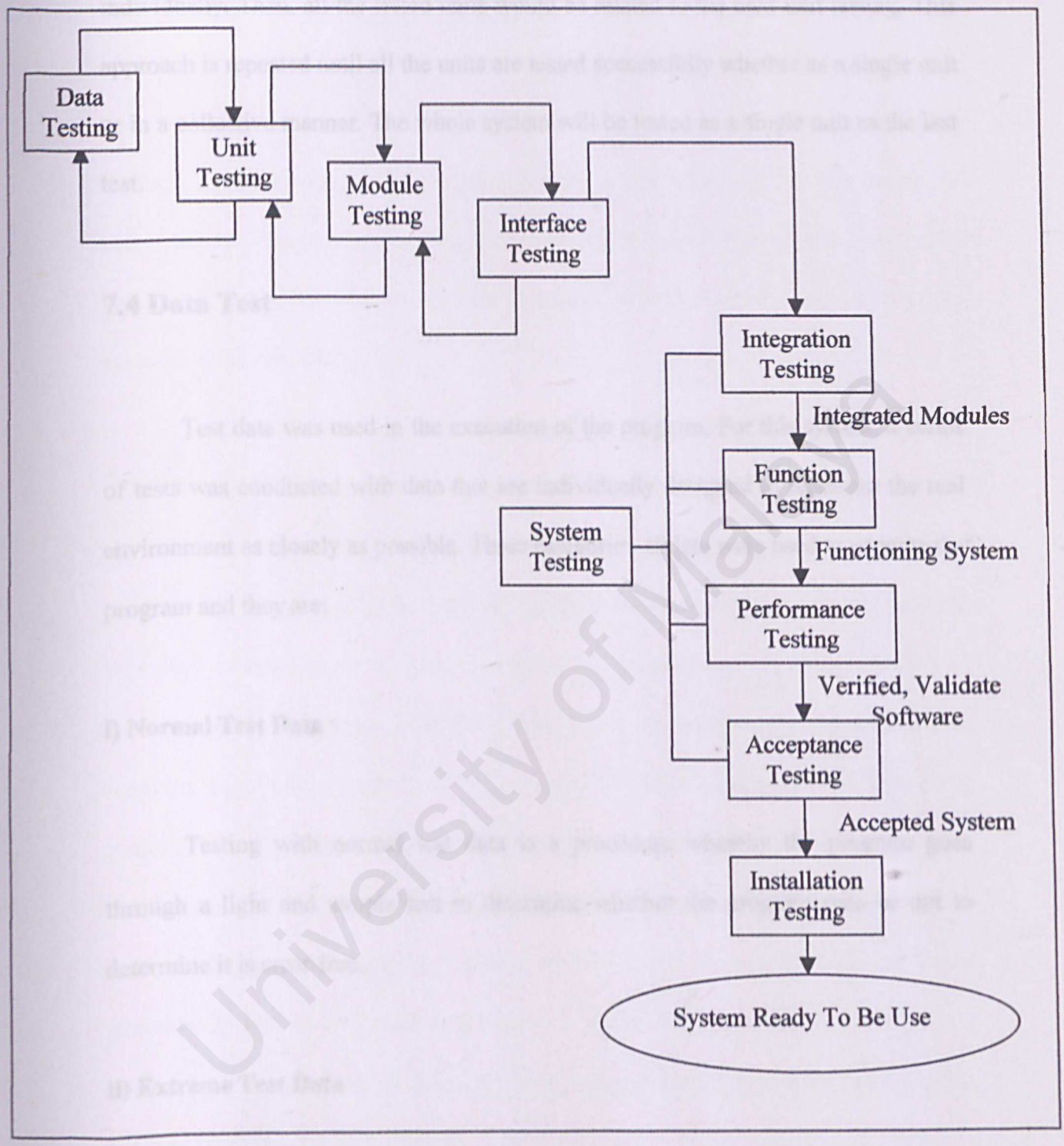



**Figure 7.1 : Testing Process**

## 7.3 Testing Approach

Bottom-up approach is adopted in system testing for Wellness Integrated Information System. Each unit at the lowest level of the system hierarchy is tested

individually. Then, all the tested units would be related to the next unit testing. This approach is repeated until all the units are tested successfully whether as a single unit or in a collective manner. The whole system will be tested as a single unit as the last test.

## 7.4 Data Test

Test data was used in the execution of the program. For this system, a series of tests was conducted with data that are individually designed to represent the real environment as closely as possible. Three categories of data were used to execute the program and they are:

**i) Normal Test Data**

Testing with normal test data is a procedure whereby the program goes through a light and simple test to determine whether the program runs or not to determine it is error-free.

**ii) Extreme Test Data**

Testing with extreme test data is a procedure whereby the program goes through an intensive test. This test is necessary in order to determine the system's capacity and how well the system can handle huge amounts of data without affecting its accuracy and efficiency in performance.

**iii) Erroneous Test Data**

Testing with erroneous test data is a procedure whereby the program goes through an erroneous test. Erroneous test is a test where errors are keyed in intentionally. This test is vital to determine how the program or system can handle such errors or incorrect data and from there, the reliability and the efficiency of the system can be predicted.

## 7.5 Unit Testing

Unit testing aims at the verification of the smallest unit a program. Each unit is tested independently to assure accuracy. It focuses on evaluating individual modules within a program. In Wellness Integrated Information System, each module contains sub-modules, which in turn consist of different functions and units. A module is independent of other modules. The sub function and input forms are verified and the flow from page to page is tested first. It is follow by the testing of the relation between pages and shared-data integrity. These functions are tested individually before the entire application is tested. The main objective of he unit testing is to ensure program accuracy, data integrity, usability and efficiency at the module level.

In the unit testing, dynamic analysis test is undertaken. Dynamic test require the module to be executed on a machine. To do this, white-box testing is conducted. White box testing is a test case design method that uses the control structure of the procedural design to derive test cases. It can be conducted parallel for multiple modules.

The steps for unit testing are:

i) Manually examine the code simply just before reading through it, trying to spot algorithm and syntax errors.

ii) Comparing the codes with the specification defined and also with the design is necessary to ensure all relevant cases are considered.

iii) Compile the code and eliminate remaining syntax faults.

iv) Develop test cases to show that the input is properly converted to the desire output.

Testing in this system is focused on Article Management and Question & Answer Forum module. The following section discusses some of the modules testing in detail.

**i) Article Management Module**

- Only Wellness Administrator can access this module to add, edit and delete articles.
- Committee Members, Participants and Visitors will not have the right to access this page. They can only view the articles.

**ii) Question & Answer Forum Module**

- Any user who wants to post a question must make sure that all the fields are fill in. If any field is not fill in, a message box will be pop up to prompt the user to fill in the field.

- Any user who wants to reply to any of the selected questions must also make sure that all the fields are fill in. If any field is not fill in, a message box will be pop up to prompt the user to fill in the field.

## 7.6 Module Testing

Module testing includes testing of all the various modules in Wellness Integrated Information System. Units in different modules are tested together to ensure the flow between the codes of the modules is not disrupted. The integrated units of codes must be checked intricately so that any error can be identified between the flows of the modules. If any error occurs, each unit will be retested to figure out the problems. The main reason is although each sub module performs its task correctly, the end result produced may be incorrect when all the sub modules work together.

## 7.7 Interface Testing

The interface should be user-friendly and not misleading. It is crucial to ensure the user understands what they are doing and what is the expected outcome. Instruction must be given in an appropriate manner and time. Error messages should be clear and straight to the point. However, this error messages should not incur any bad impact on the user, leaving discouragement to use the system.

Besides that, the interface design should not lead the user to key in invalid entries. Data type like date format and date length should be controlled to avoid unnecessary problems. For example, the use of Java Script will help to eliminate the

problems of date format. For every input text, the maximum length must be set according to data property in the database.

## 7.8 Integration Testing

Integration testing is where combined modules that are dependant on one another are tested to determine if they function together as one. This is because integrated modules can be incorrect or inconsistent although the modules were i8ndividually proven satisfactory, as shown by the successful unit testing. Integration testing is specially aimed at exposing the problems that arise from the combination of modules. Variables and parameters passing are all tested during this phase. The approach used in this testing is the Top-Down integration approach, where then highest level of the main module is tested first, followed by the sub-modules. Every link to all modules is tested and all components must be tested again after the integration. White box and black box testing was used and every output is verified.

Integration testing ensures that valid linking and dynamic relationship are established between sub-modules and modules of the whole system. The testing is constructed and tested in small segments where errors are easier to identify.

Once the functional test is completed, performance test is performed to compare the integrated modules with the non-functional system requirements. These requirements include reliability, efficiency, maintainability, user friendliness and others to ensure that the system being developed is fully functional and optimized.

## 7.9 Function Testing

The sub-systems are integrated to make the entire system. In this case, the login, Question & Answer board and notice board modules were combined and tested. Therefore, the main purpose in system testing is to find errors that result from unanticipated interactions between sub-systems. It is also used to validate whether the system meets its functional and non –functional requirements.

## 7.10 Performance Testing

This test is conducted by putting the system through different computers with different specifications. Tests were also conducted in different times of the day to make sure that the system is tested thoroughly with different connection speeds. The system was also tested with a full range database already filled up with data to ensure that the system can really perform as specified.

## 7.11 Acceptance or User Testing

The final testing procedures in Wellness Integrated Information System is the acceptance or user testing whereby users will be actively involved in this stage to test the system to ensure that the system meets their requirements. The main purpose of this testing is to verify whether the system has fulfilled the user's requirements. During this test, besides the functionality of the system is demonstrated to users, users from different background are given the opportunity to experience and explore the system themselves.

## 7.12 Summary

At the end of the testing phase, the system should be able to perform the tasks required and error free. This is important to obtain user's confidence towards the system. However, there some problems and errors will only occur after some time using the system. Therefore, the work of testing should not end up in this phase but have to be maintained on from time to time, making sure the functionality of the system.

# 8.0 SYSTEM EVALUATION

## 8.1 Introduction

This is the final phase in the life cycle of this project. During the period of coding and implementation, various technical and non-technical problems were encountered. However, most of the problems were detected and resolved eventually but some are not.

In this phase, Wellness Integrated Information System will be evaluated to identify its total strength and constraints. The evaluation of this system is concluded by views from the system developer, and also collected from views of Faculty of Computer Science and Information Technology (FCSIT) lecturer and students. Changes and current enhancement will be stated as a reference. Besides that, proper recommendations and proposals will be suggested to enhance system's performance and functionality in the future.

## 8.2 Problems Encounter and Solutions

### 1) Problems In Tools And Language Selection

There are a lot of good and potential development tools available for the use of developing the system. However, not all these are suitable as each and every tool has its own strengths and weaknesses. The task of choosing the right development tool will always remain as the toughest question to answer.

In search for the best combination of programming language development tools for the system, some information findings methods and the system

requirements are analyzed. Authoritative electronic resources from the Internet, advises from the lecturers and discussions among the experienced course mates have help to finalize the development tools selection.

**2) Lack Of Knowledge And Experience In The Web Development**

Lack of knowledge and experience has proved to be an obstacle in the beginning. This is because the concepts of web programming and application are quite hard to understand, as it is different from the conventional programming concepts. The new exposure towards PHP (Hypertext Preprocessor) and MySQL has increased the learning curve before starting the development of Wellness Integrated Information System.

Surfing the Internet for information and reading up on the concept of client-server and Internet programming which included the operation of web server, were some of the approaches taken to overcome this problem. Most of the ambiguities are resolved by reading up on relevant materials but the most important is advice and guidance from lecturers and course mates.

**3) Problems In Reducing Program Code Size**

System optimization is always an essential initiative in any system development. The purpose of system optimization is to increase its efficiency or to improve its performance without major upgrades on any hardware. As for the Wellness Integrated Information System, these optimizations would be in the form of

improving its execution and response times. This can be theoretically achieved through a smaller program code size.

**4) Difficulties In Designing User Interface**

Problem that faced during the early stage of development is lack of knowledge and experience of real system flow and layout of user interface. Therefore, it is difficult in designing the most appropriate logic and user interface in Wellness Integrated Information System. Moreover, to make the web page more interactive and dynamic, it needs great knowledge of advance scripting language. These eventually make the process of development becomes slow.

To get more knowledge about the system flow and user interface design, some real commercial web sites and training application were used as reference. Besides that, image editing tools especially Adobe Photoshop was used to generate attractive images. This will make the user interface more presentable and attractive.

## 8.3 Evaluation By End-User

The Wellness Integrated Information System's end user evaluation involved users from different types of background. It consists of user with computer knowledge, normal user with minimum computer skills and those who computer illiterate. Each user was assigned to different level of privileges to be tested namely, the wellness administrator, committee members, participants and the visitors. The questionnaire used to carry out system evaluation can be referred to Appendix C. The evaluation of this system is concluded by views from the system developer, and also

collected from views of Faculty of Computer Science and Information Technology (FCSIT) lecturer and students.

## 8.4 System Strengths

The Wellness Integrated Information System strengths were recognized and identified as below.

### 8.4.1 Simple And User-friendly Interface

The interface of the system is simple and easy to use. The system makes full use of Windows, Icons, Menu and Pointer ( WIMP ) techniques. There are also many features included to make the interface user-friendly such as text box, buttons and links. These features will help the user to navigate through the system. User-friendly interface will help to reduce the total cost of developing and implementation of the system because the training cost and time required can be reduced. Clear, precise instruction guidance is also given to guide the user. Hence, users will find Wellness Integrated Information System easy to use and understand.

### 8.4.2 Fast Response Time

Generally, most of the web pages in Wellness Integrated Information System are designed as simple as possible to allow faster loading and reducing the downloading time. Large size graphical images are avoided. Consideration has been taken into the scripting part where overhead of calling script are kept to a minimum.

The data validations are also carried out at the client side to enhance faster response time.

### 8.4.3 Different User Privileges

This system can be access by four different types of users. They are Wellness Administrators, Committee Members, Participants and Visitors. Users except visitors must login to get the permission to access some of the system features. Therefore, users can only access the pages that they have been authorized to.

### 8.4.4 Security Features

This system includes the security control that only allows the authorized user to access the system. It has a login module where a user who wants to access the system needs to supply a login username and password. Since the Wellness Integrated Information System is password-protected site, each user will has an unique login username and password. Hence, unauthorized users are prohibited from accessing its records stored in the database.

### 8.4.5 System Transparency

System transparency refers to the condition where the users do not need to know where the database resides, how is the system structure, its database management system and anything that are related to the system being built. All they

need to know is to submit the data required and then view the result. This is important to avoid any confusion among the users.

## 8.5 System Constraints

Although much effort has been made to build the Wellness Integrated Information System to meet its requirements and minimizing the errors, the system still have it's own constraints. These constraints could not be avoided due to the lack of experience in web-based system development and limited time. The system constraints are listed below.

### 8.5.1 Browser And Platform Limitation

At the moment, not all browsers and platforms is supported by the Wellness Integrated Information System. It is recommended that this system run on Microsoft Explorer 4.0 and above. Without these requirements, then it is impossible to run PHP pages. The unsupported platform and browser combination is Macintosh and IE5 due to a known bug in the Mac version of IE. This limitation is due to the usage of JavaScript. Web browser such as Netscape Navigator will also give different effect on layout design and some other functions may not work properly in this browser. Therefore, Internet Explorer is recommended because it supports more scripting language such as JavaScript.

### 8.5.2 Limitation On Interface Design

As a formal application system, the Wellness Integrated Information System is designed in such a way to suit the environment. The interface design is limited to avoid too many animation, sharp colors and funny images. It has to be impressive and yet professional looking. Features such as satisfaction, pleasant looking and user friendliness have to be taken into consideration while developing on the user interface.

### 8.5.3 Time And Manpower Constraints

The Wellness Integrated Information System is quite a large system. There is a need to have more time to build a more efficient system. Moreover, this system is only being developed by two persons. It should be consists of three or four person in order to accomplish the system perfectly. Nevertheless, when this new system successfully developed, it will need future enhancement and system maintenance from time to time.

## 8.6 Future Enhancement

As Wellness Integrated Information System continues to evolve, future enhancement will be needed to improve the overall system performance and functionality. Therefore, it is hope that the following aspects could be considered in the future development of the system.

### 8.6.1 Auto Generated Mail Alert

In the Wellness Integrated Information System, it has been proposed that email will be sent out automatically to those participants that absence from the Wellness lesson for three times. This is to notify the participants about their attendance. The component needed for sending mail is the SMTP mail server.

### 8.6.2 Browser and Platform Independent

As mentioned, this system requires Microsoft Internet Explorer 5.5 and above for execution. In future, it can be turned to fulfill other browser requirement such as Netscape Communicator or Macintosh for operation. This is because Netscape has a size scalable share in browser besides Internet Explorer.

### 8.6.3 Adding Charts Module

In the future and as part of enhancing the system, the Wellness Integrated Information System should be able to generate charts. This chart module can present the participants progress in graphical method instead of figures and numerical values. Through the charts, information regarding progress and comparisons are obvious at a glance. Besides that, members can view their progress, interpret trends and cycle and even predict the outcome of the Wellness Programme whether it is beneficial or not.

## 8.7 Knowledge And Experienced Gained

A lot of technical and non-technical knowledge has been experienced through the entire development of Wellness Integrated Information System. The development of this project involves various software applications such as PHP, Apache, MySQL, Adobe Photoshop, Macromedia Dreamweaver and others. Besides that, knowledge on how to write new languages is also gained throughout then development phase of Wellness Integrated Information System.

PHP provides very powerful features, enabling one to create highly interactive and dynamic web pages. With its strong integration with Apache and MySQL, PHP can be one of the most prominent web developing programming language. Moreover, theories and knowledge gained throughout the course of studies like system analysis and design, software engineering and others were literally put into practice.

## 8.8 Summary

Chapter 8 presents the system evaluation in terms of problems encountered and its solution, evaluation by end users, system strength and system constraints. Future enhancement is also included in this chapter so that the Wellness Integrated Information System can be further enhanced to provide better quality system. This chapter concludes with the knowledge and experienced gained during the software development.

## 8.9 Conclusion

Overall, Wellness Integrated Information System has achieved the system objectives defined during the analysis stage and fulfilled all the functional and non-functional requirements. Throughout this project, useful knowledge and experience are gained. From the development of Wellness Integrated Information System, time is needed to master languages like HTML, PHP and JavaScript that are useful in web programming. Besides that, theories and knowledge gained throughout the course of studies like system analysis and design, software engineering and others were literally put into practice.

Wellness Integrated Information System has fully tested and is a reliable system. The software engineering concepts, principles and techniques applied in Wellness Integrated Information System are carefully selected and analyzed to determine its suitability. The development of this project using these techniques will ease the tasks of future enhancements and expansions for Wellness Integrated Information System. These experiences are especially helpful in future involvement of software development.

# APPENDIX A: USER MANUAL

# APPENDIX A – USER MANUAL

## A.1. Introduction

The Wellness Integrated Information System is a system in the form of a website and an integrated database which provides a secure and reliable environment for basic knowledge on healthy living, medical and health care information. There are four major types of users in this system namely, the Wellness Administrator, Committee Members, Participants and Visitors. Each of them is restricted to access certain functions or modules provided to them in the Wellness Integrated Information System. In order to ensure authorized access to the system, user's login and password validation will be required.

## A.2. Starting Wellness Integrated Information System

Firstly, browse into the main page with URL http://<hostname>/wellness/index.php. Usually, the <hostname> is localhost. Therefore, the normal URL should be http://localhost/wellness/index.php.

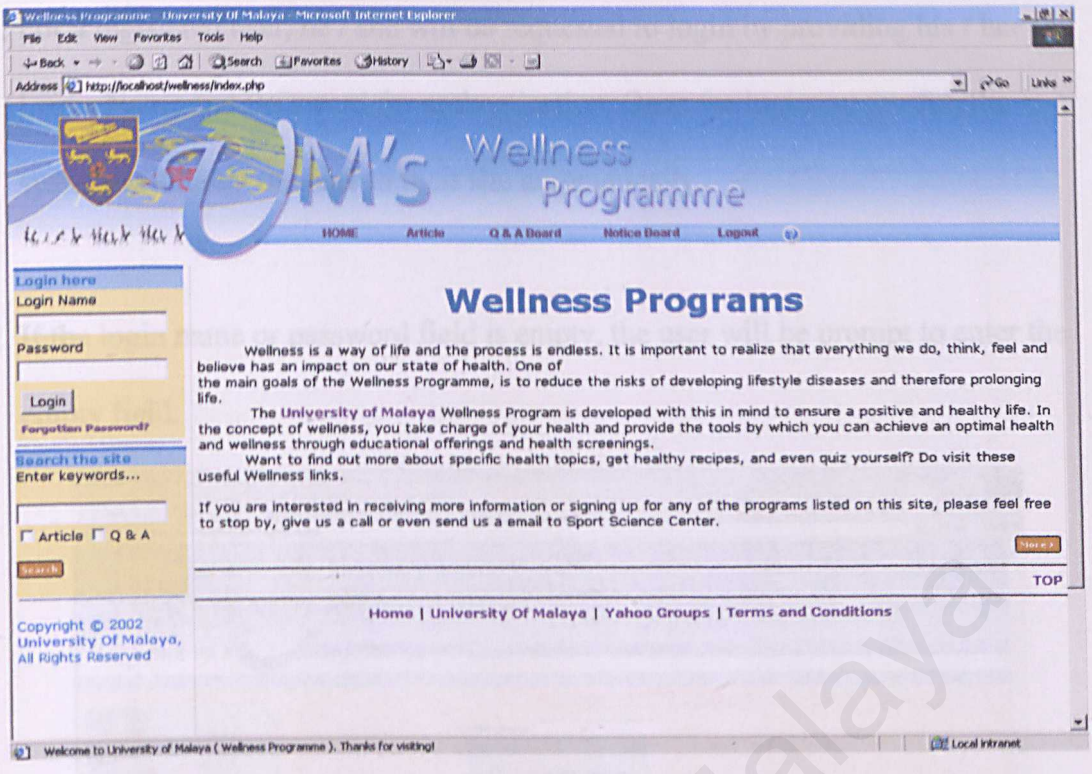



**Figure A.1 : Wellness Integrated Information System Homepage**

## A.2.1. Login / Logout

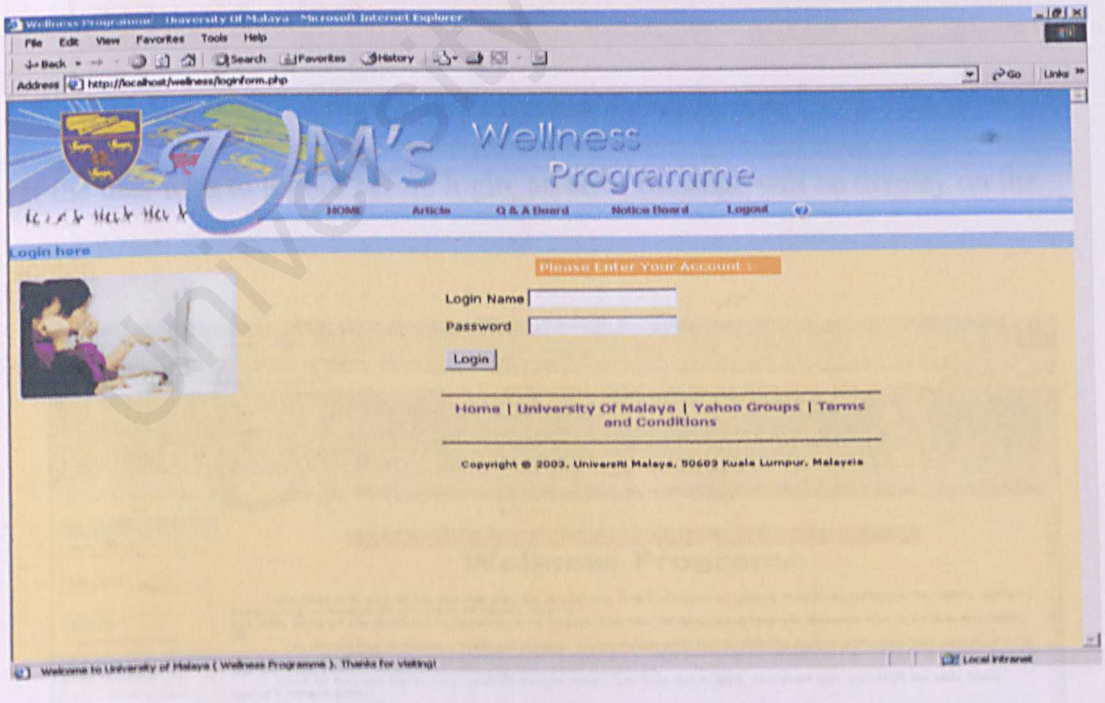



**Figure A.2 : System Login Page**

1. For a registered user, he / she will be requested to login by providing his / her Login Name and Password for authentication. Once the login successful, the system will direct the user to their site automatically.

2. If the login name or password field is empty, the user will be prompt to enter the empty field.

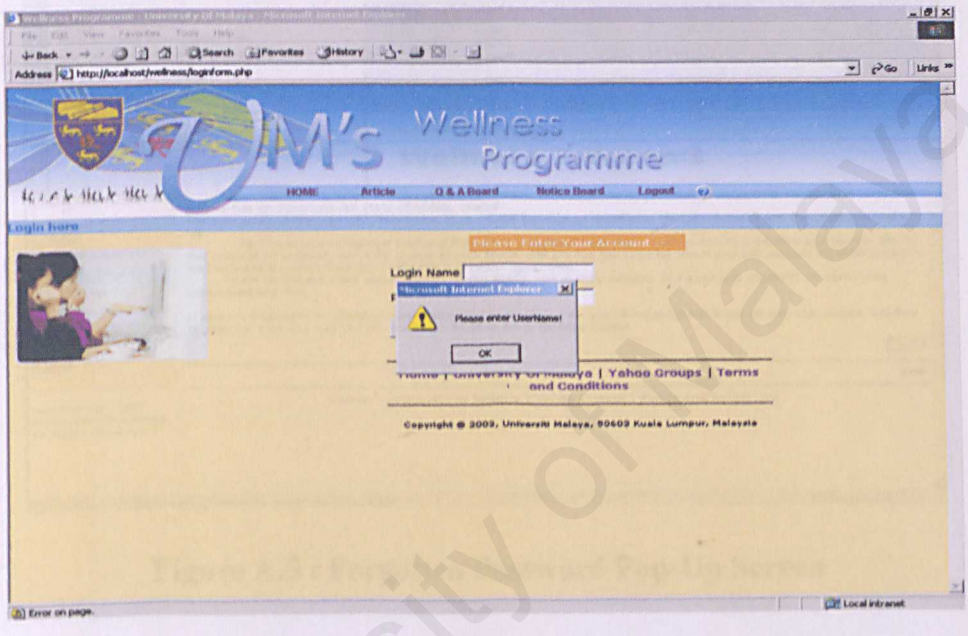



**Figure A.3 : System Input Error**

3. If the user tries to logout before login, an error message will be display on the screen

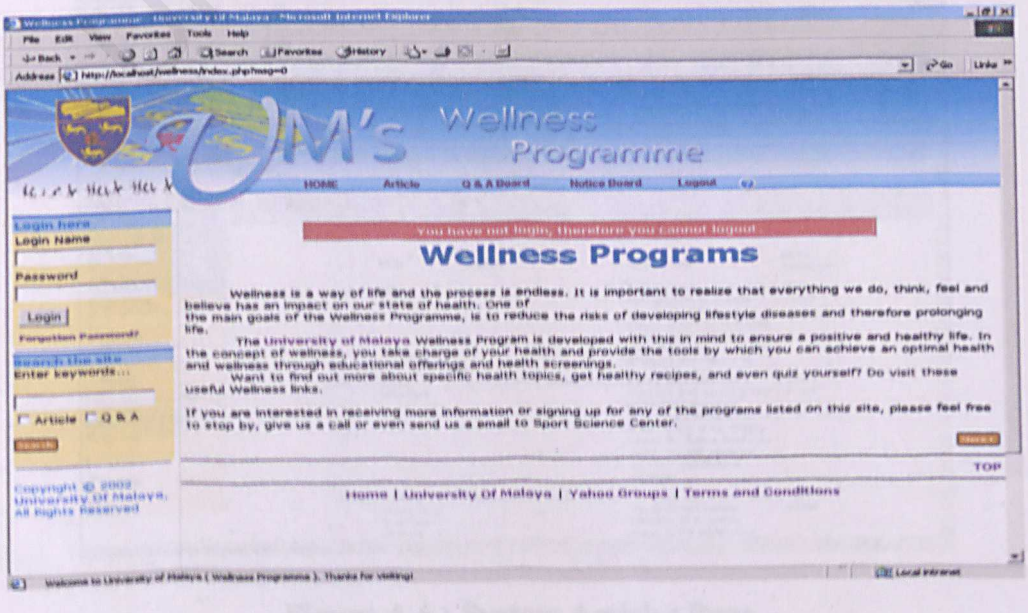



**Figure A.4 : Logout Page Error**

4. If the user forgotten his / her password, he / she can retrieve back the password by clicking the forgotten password link. A pop-up screen will appear to ask the user to input their login name and email address so that their password can be sent to them.

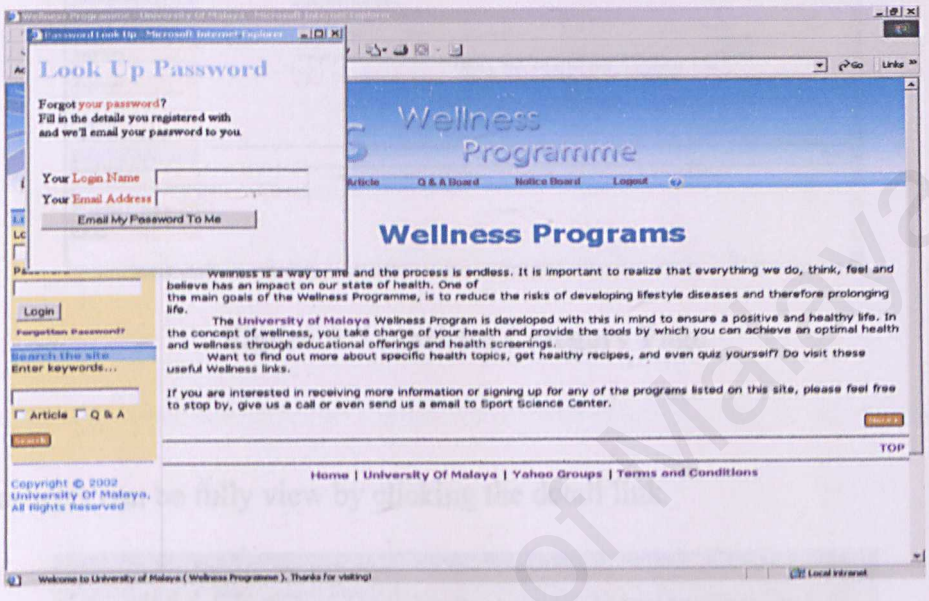



**Figure A.5 : Forgotten Password Pop-Up Screen**

## A.2.2 Articles

1. Here the users can view the articles being post into the system.

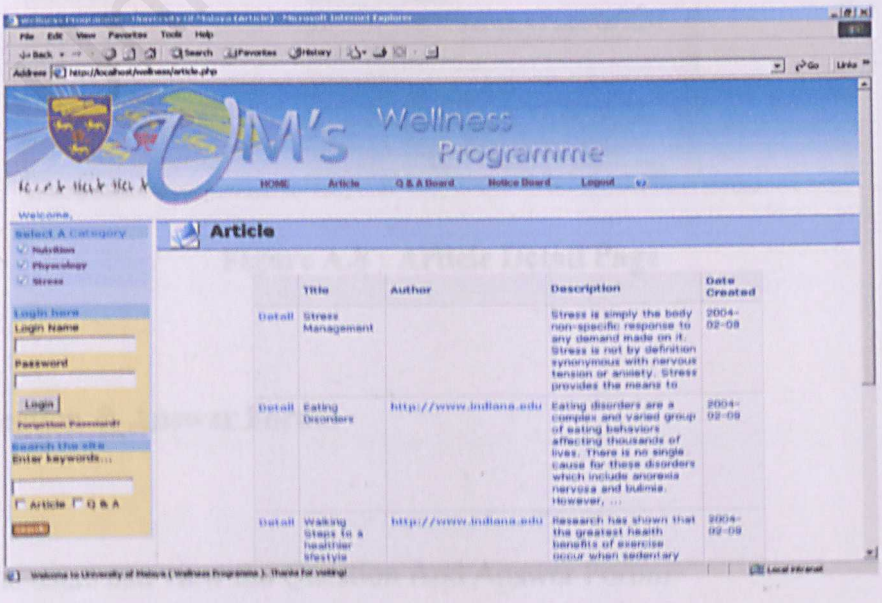



**Figure A.6 : System Articles Page**

2. All the articles are divided into their own categories on the left side of the articles page

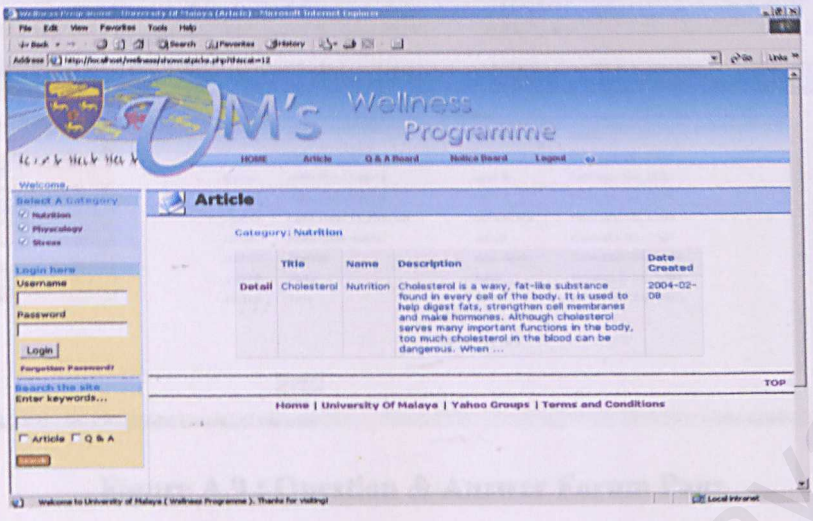



**Figure A.7 :Articles Category Page**

3. The articles can be fully view by clicking the detail link

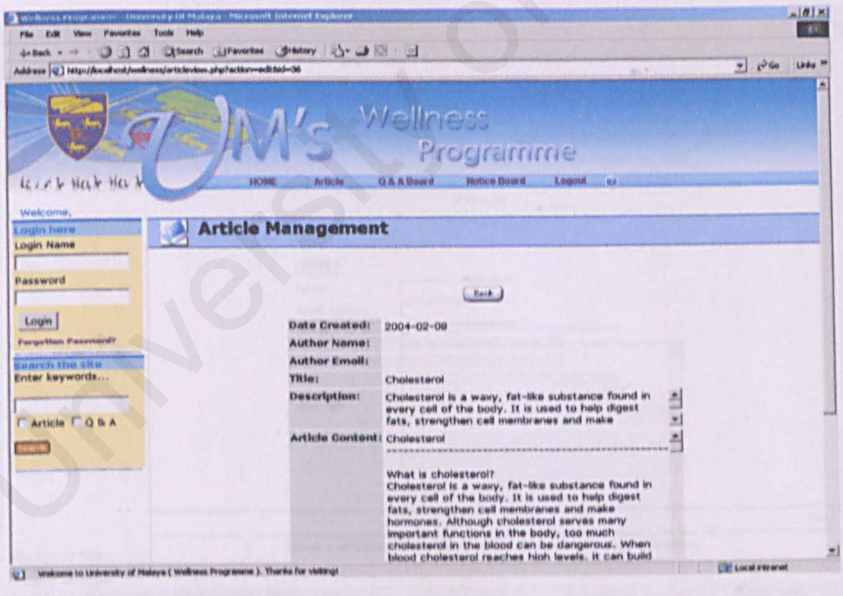



**Figure A.8 : Article Detail Page**

### A.2.3 Question & Answer Forum

1. Here the users can view the Question And Answer Forum

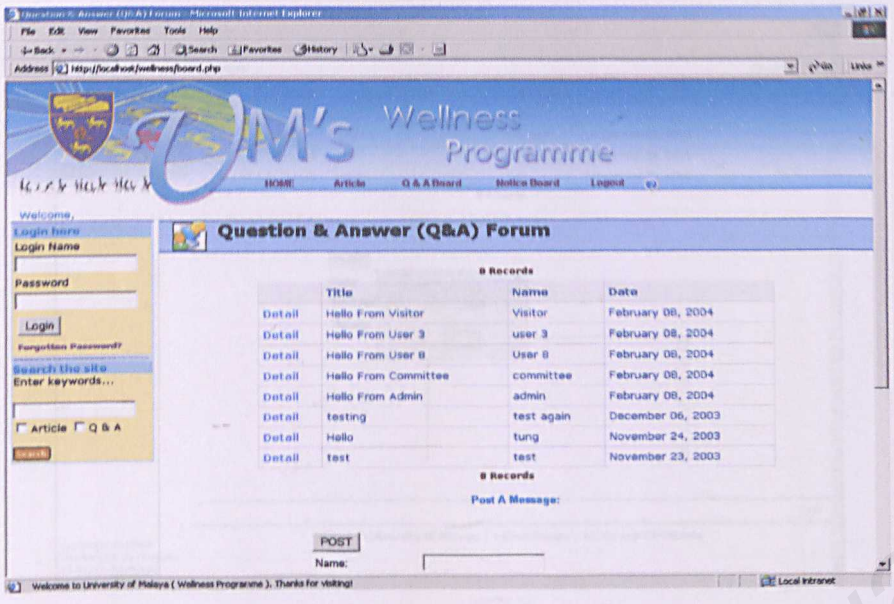



**Figure A.9 : Question & Answer Forum Page**

2. The users can post questions to the forum if there is any doubts or questions regarding the problem.

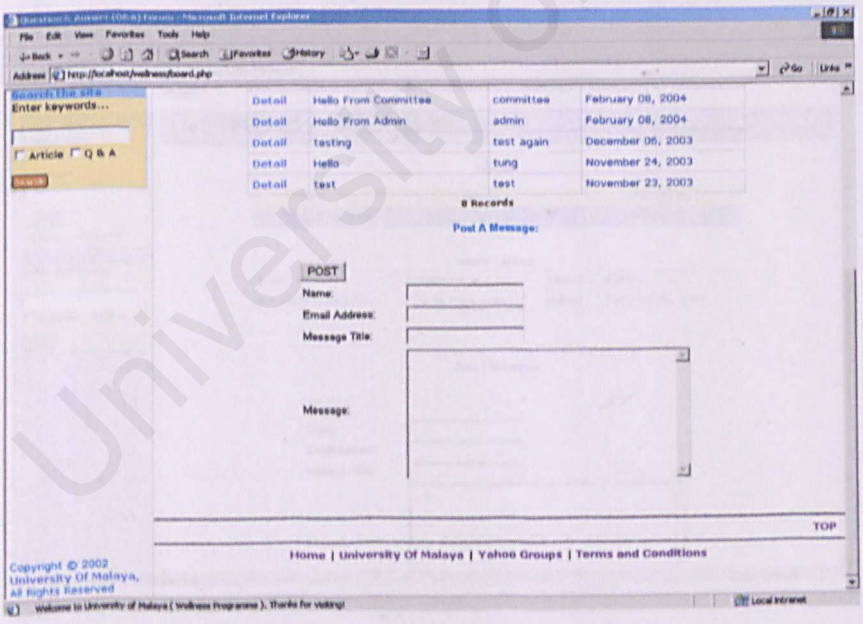



**Figure A.10 : Question & Answer Forum Post Page**

3. All the fields are required. If any of the field is empty, the user will be prompt to enter the empty field. This is the same for the reply page.

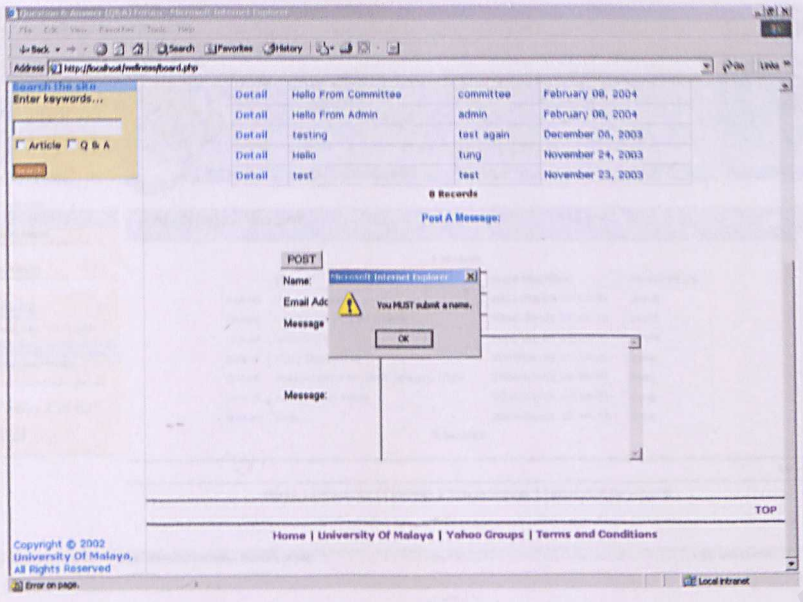



**Figure A.11 : Question & Answer Forum Post Error**

4. If the users want to reply to any of the questions, all they need to do is to click the relevant detail question and reply their answer there. All the fields are required.

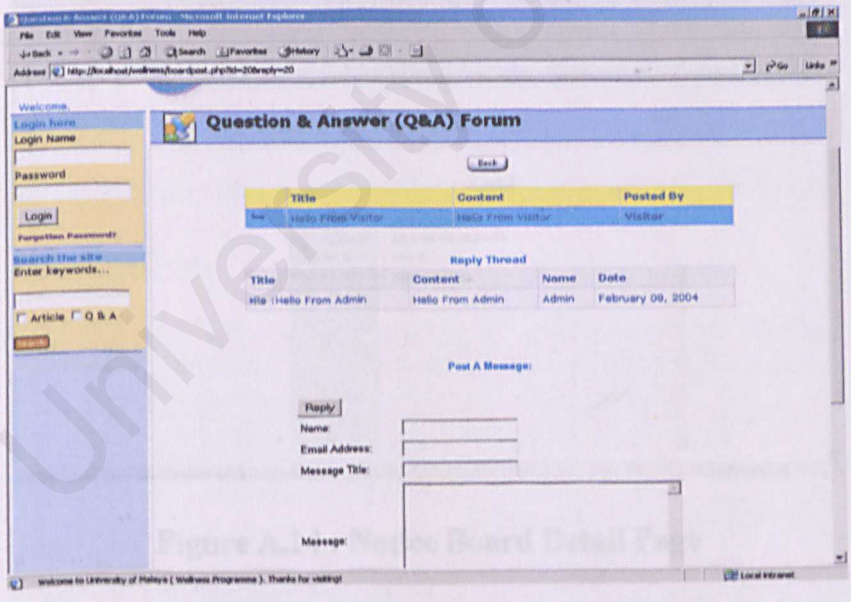



Figure A.12 : Question & Answer Forum Reply Page

## A.2.4 Notice Board

1. Here the users can view those notices can are posted by the Wellness Administrator or the Committee Members.


**Figure A.13 : Notice Board Page**

2. The users can view the full notice by clicking the detail link

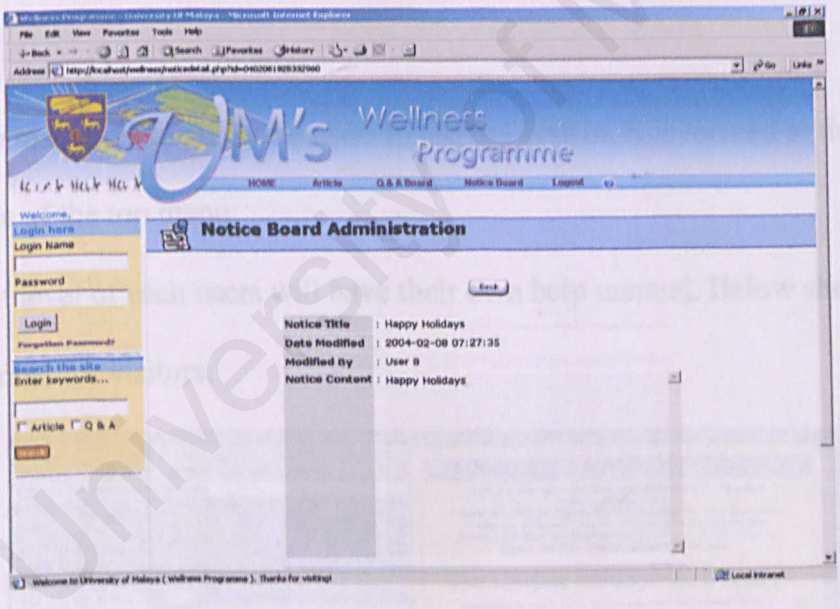



**Figure A.14 : Notice Board Detail Page**

### A.2.5 Search Function

1. The search function is to help the users to find their articles or questions. The users can choose to search either the articles or the questions and answer forum or the both. The search box is found on the left hand side of the page.

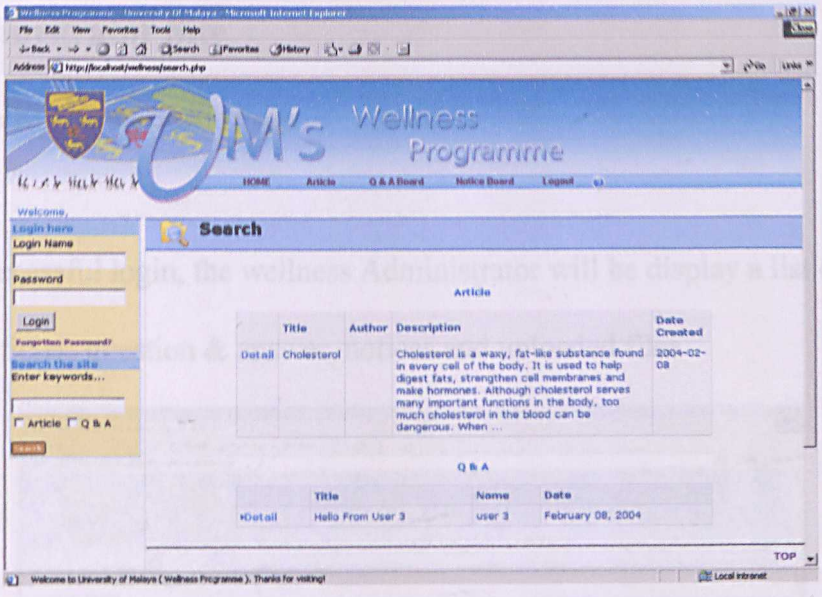



**Figure A.15 : Search Function**

## A.2.6 Help Manual

1. The help manual is to guide the users to use the system. It is located at the right hand side of the top menu.
2. Different level of each users will have their own help manual. Below shown is the help manual for visitors.

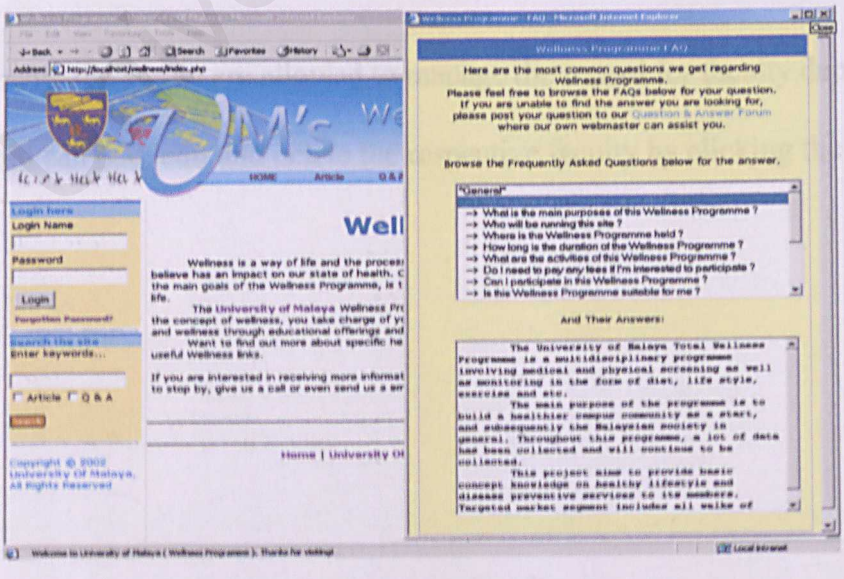



**Figure A.16 : Help Manual For Visitors**

## A.3 Administrator Site

### A.3.1 Administrator Home Page

1. Upon successful login, the wellness Administrator will be display a list of most recent articles, question & answer, notices and uploaded files

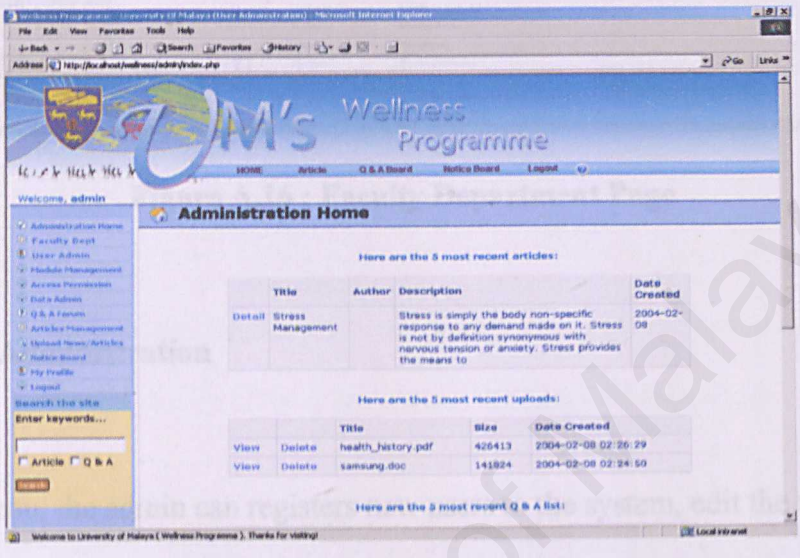



**Figure A.17 : Administrator's Homepage**

### A.3.2 Faulty Dept

1. In this menu, the admin are allowed to manage the record for faculty department. The admin can add, edit and delete the respective faculty by clicking the relevant links.

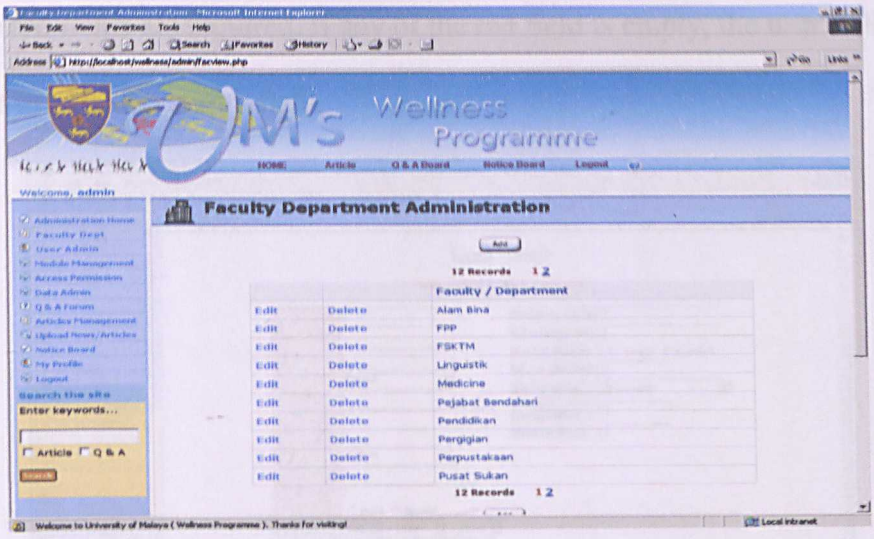



**Figure A.16 : Faculty Department Page**

### A.3.3 User Administration

1. In this menu, the admin can registers new users to the system, edit the user profile or remove the user from the system

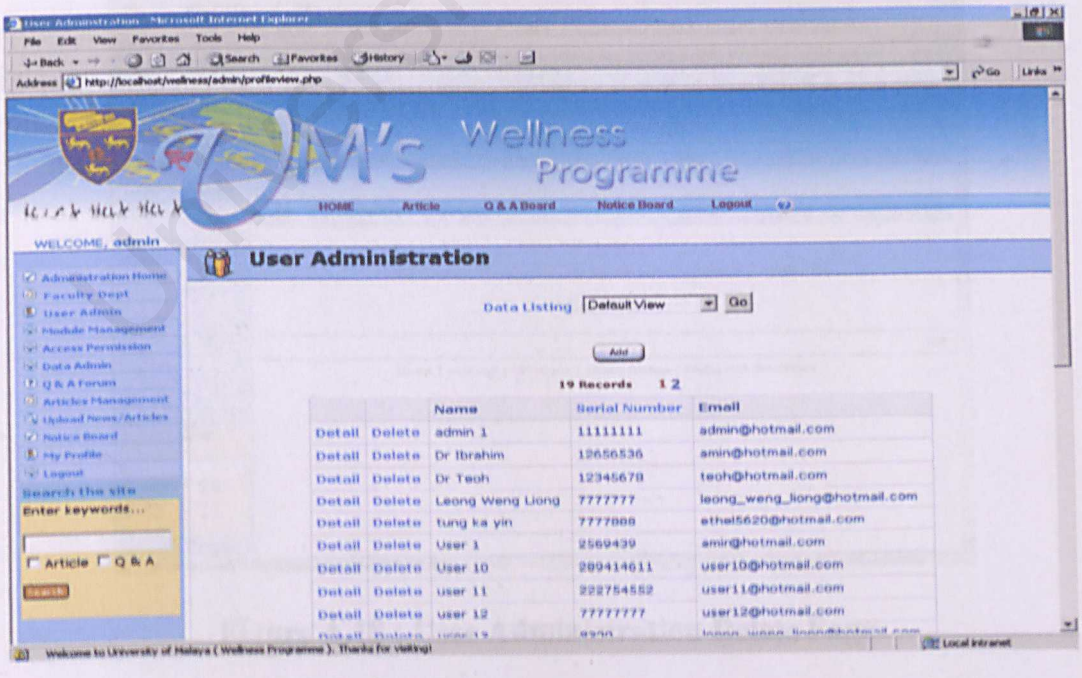



**Figure A.17 : User Administration Page**

2. All the red fields are required. If any of the red field is empty, the user will be prompt to enter the empty field.

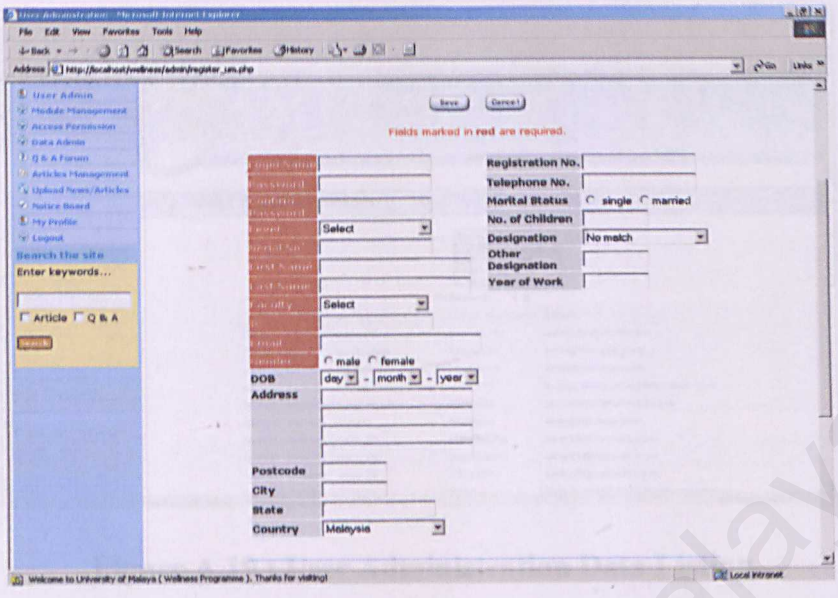



**Figure A.17 : User Administration Registration Page**

3. If the admin wants to delete one of the user records, a delete screen will be display to confirm the deletion

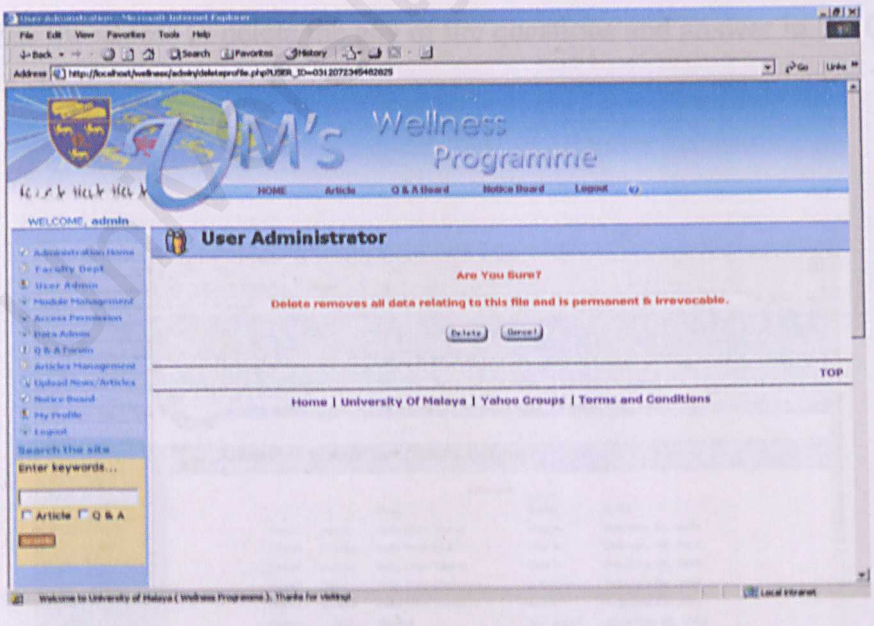



**Figure A.18 : User Administration Delete Page**

4. The admin can also sort the user records according to the date created, modified, access or the default view.

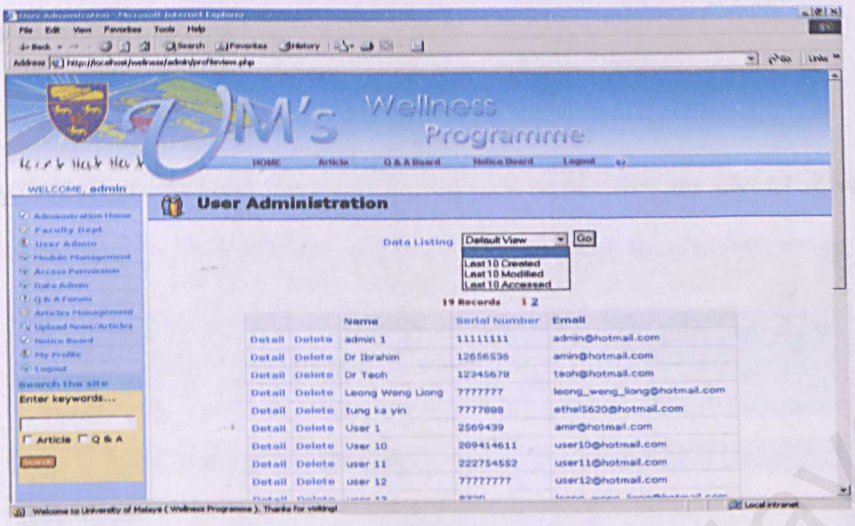



**Figure A.19 : User Administration Data Listing**

## A.3.4 Question & Answer Forum

1. The Question & Answer Forum for admin is the same for the visitors but the admin has the access to delete the any of the questions and answer in the Q & A Forum

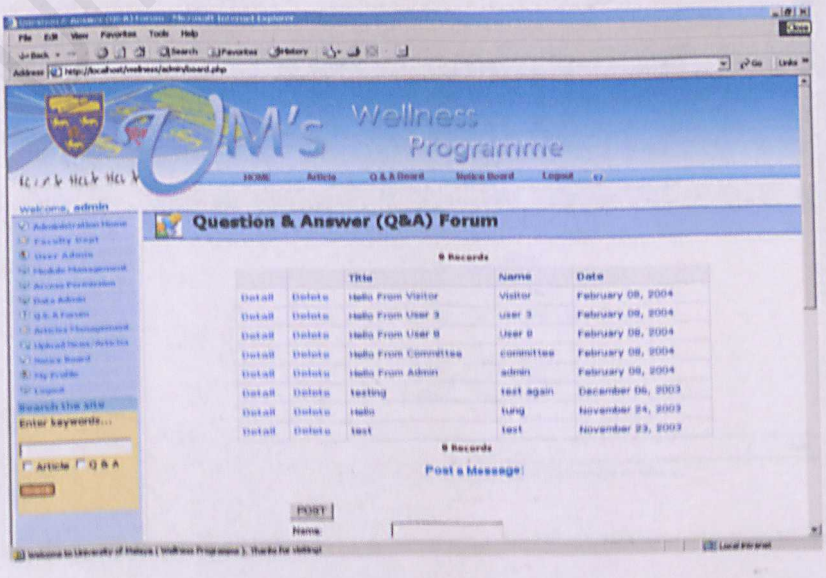



**Figure A.20 : Admin's Question & Answer Forum**

2. For the steps to use the Q & A Forum, please refer to A.2.3

### A.3.5 Article Management

1. In the Article Management menu, the admin can add category and articles.

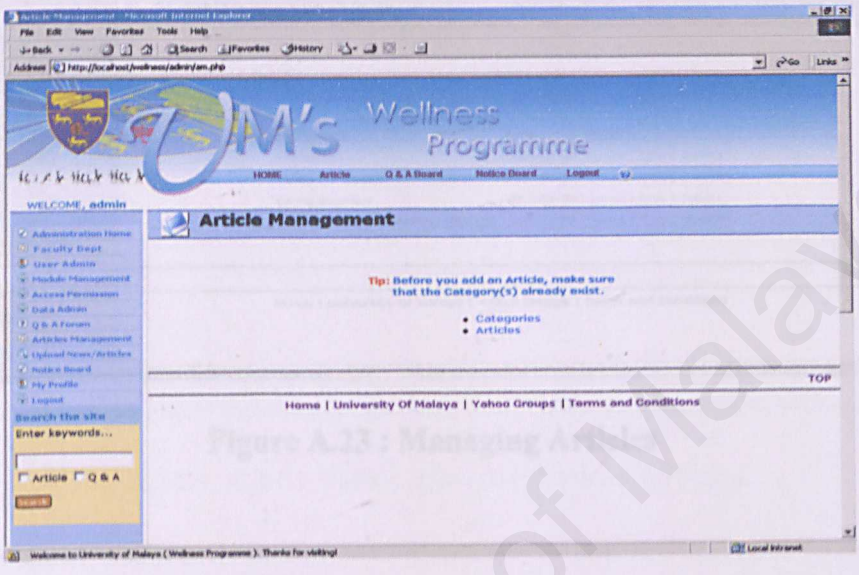



**Figure A.21 : Admin's Article Management**

2. The admin can add, edit and delete a category in the category link

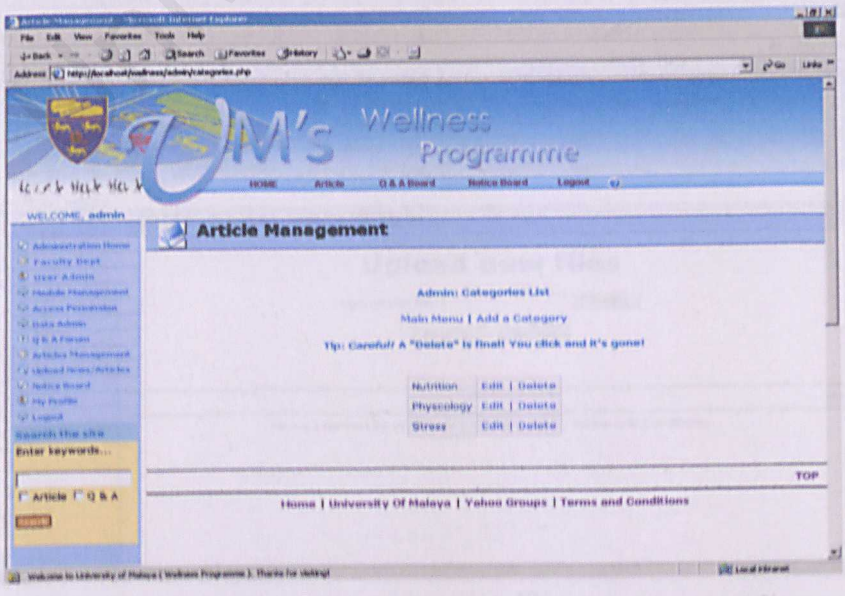



**Figure A.22 : Articles Category**

3. The admin can add, edit and delete an article by clicking the articles link

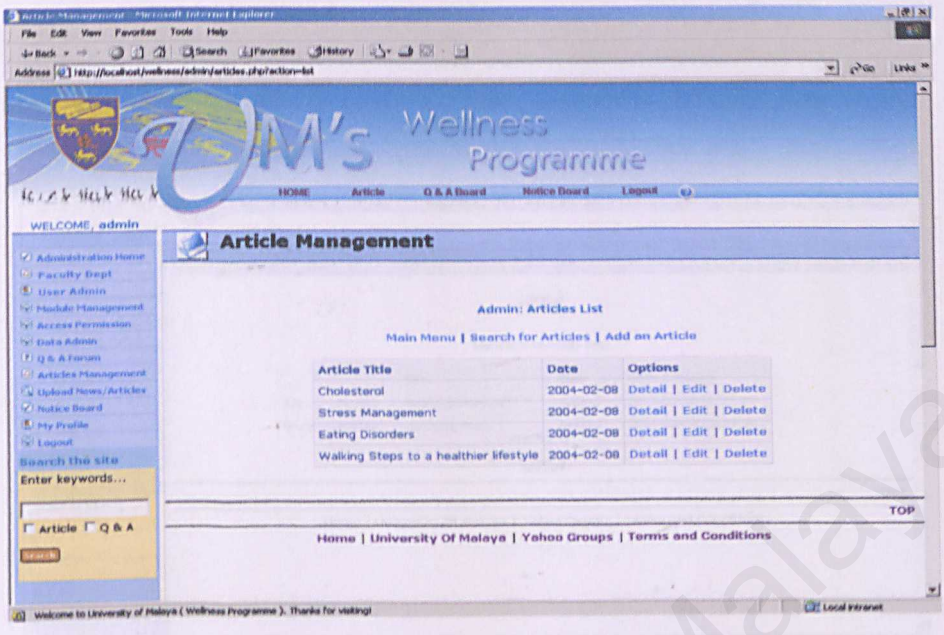



**Figure A.23 : Managing Articles**

## A.3.6 Uploading News / Articles

1. In the Uploading News / Articles menu, the admin can upload news or articles

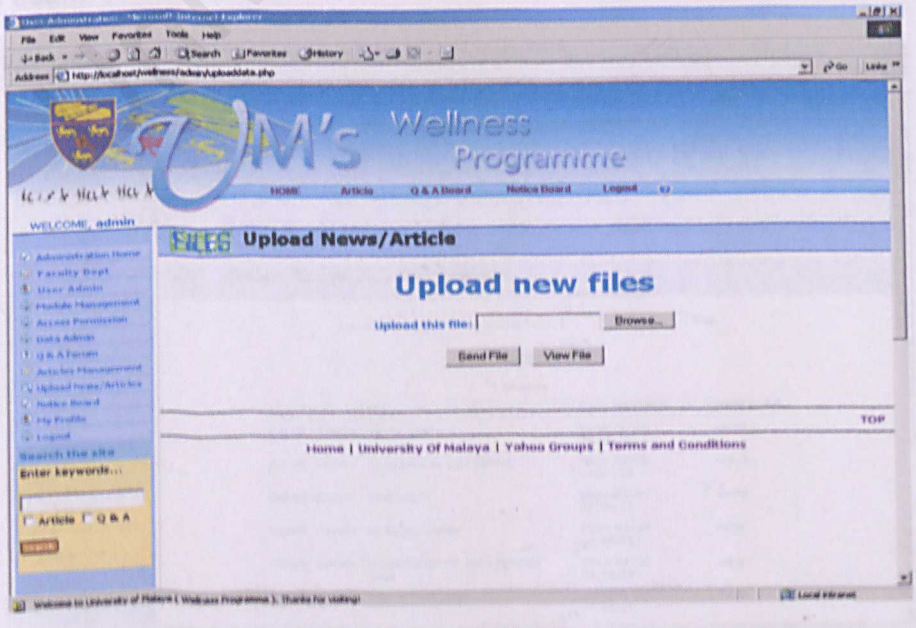



**Figure A.24 : Uploading News / Articles**

2. The admin can also delete and view the uploaded news / article by clicking the view button

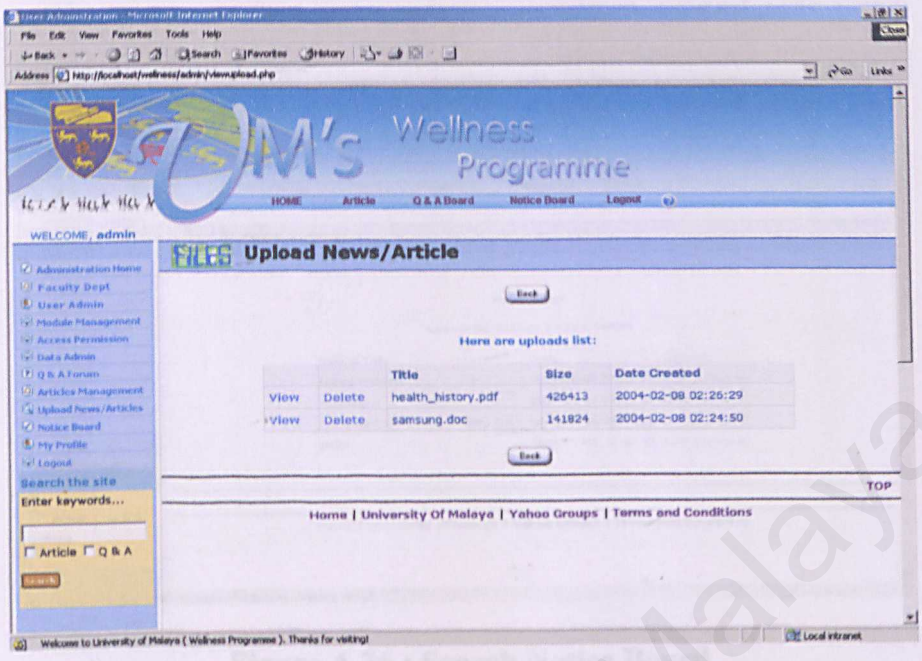



**Figure A.24 : View Uploaded News / Articles**

## A.3.7 Notice Board

1. Under the Notice Board menu, the admin can add, edit and delete the notices in the notice board

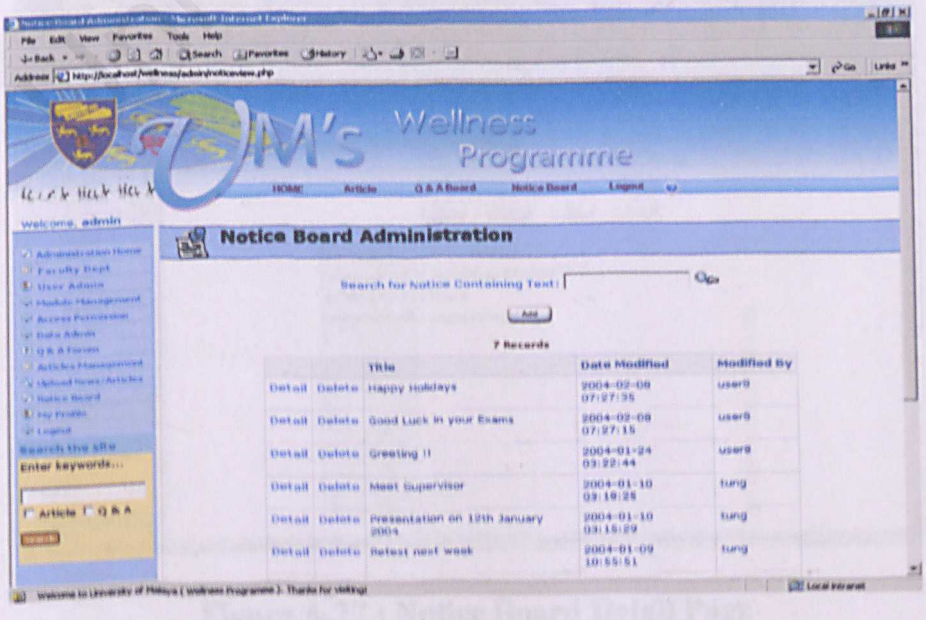



**Figure A.25 : Manage Notice Board**

2. The admin can use the search button in the notice board to minimize the search time for any editing or deletion of notices.

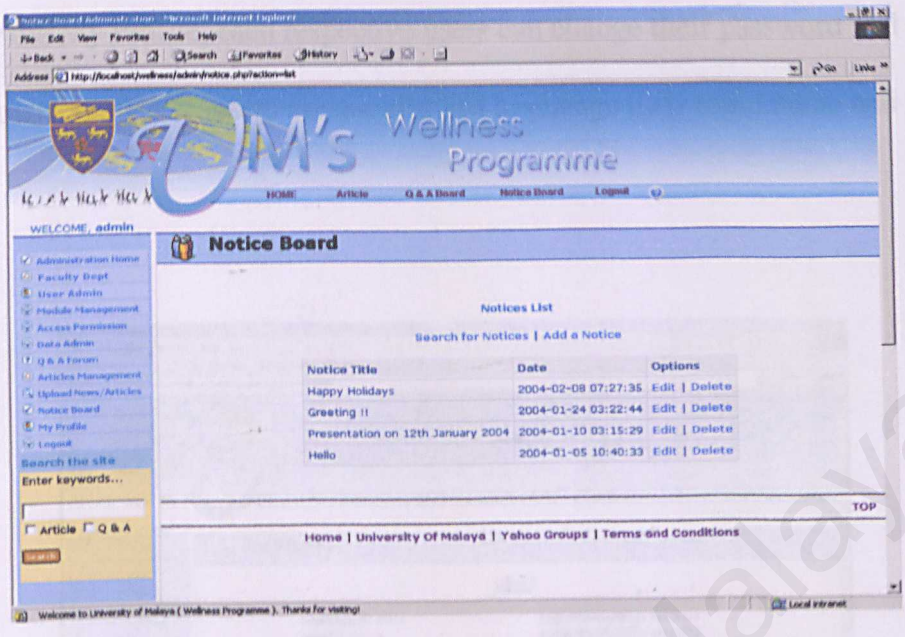



**Figure A.26 : Search Notice Board**

3. The admin can view the full notice by clicking the detail link. For editing or deleting of any notices, just click the relevant links

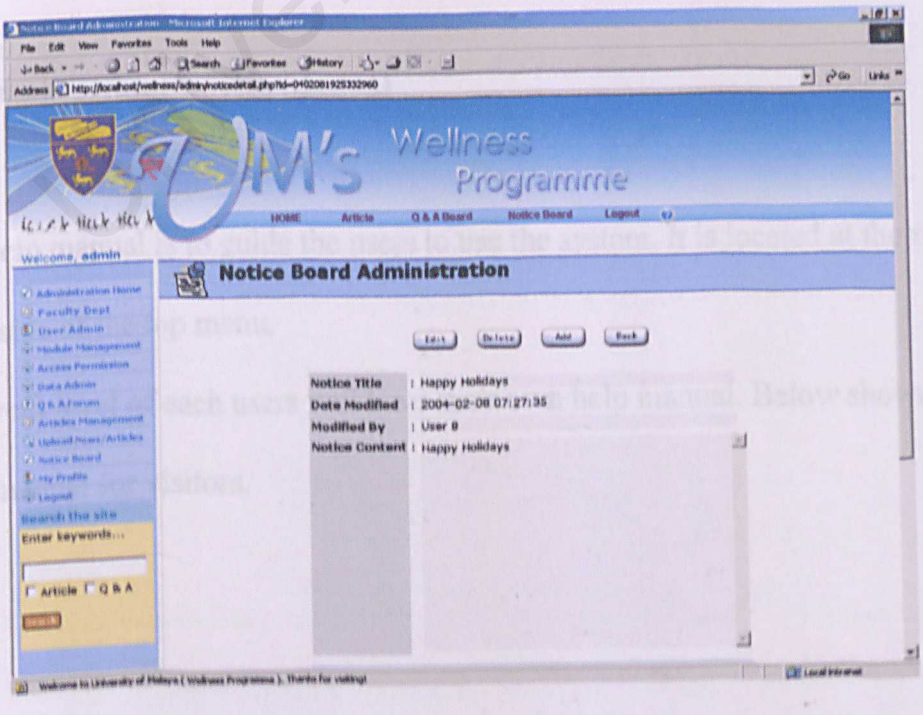



**Figure A.27 : Notice Board Detail Page**

### A.3.8 My Profile

1. Under the My Profile, each respective users can change their password and particulars. However, users are not allowed to change their login name and access level.

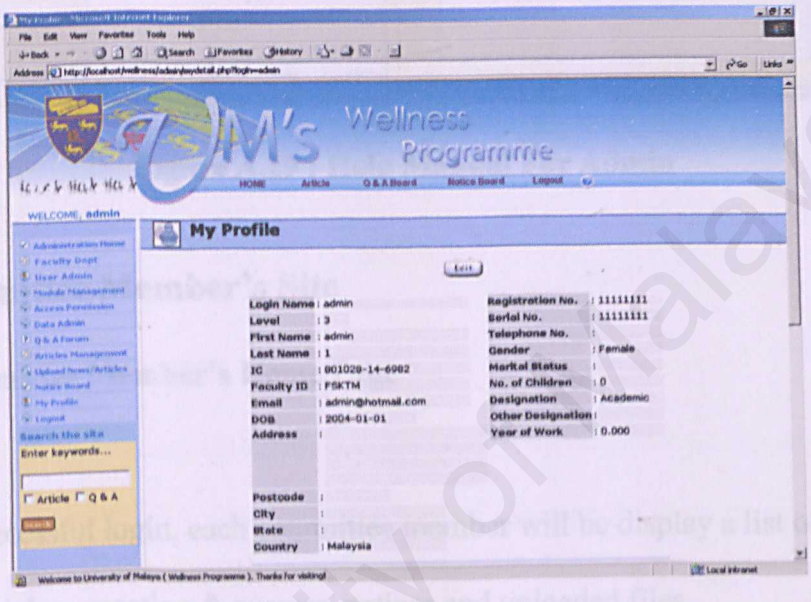



**Figure A.28 : My Profile Page**

### A.3.9 Administrator's Help Manual

1. The help manual is to guide the users to use the system. It is located at the right hand side of the top menu.
2. Different level of each users will have their own help manual. Below shown is the help manual for visitors.

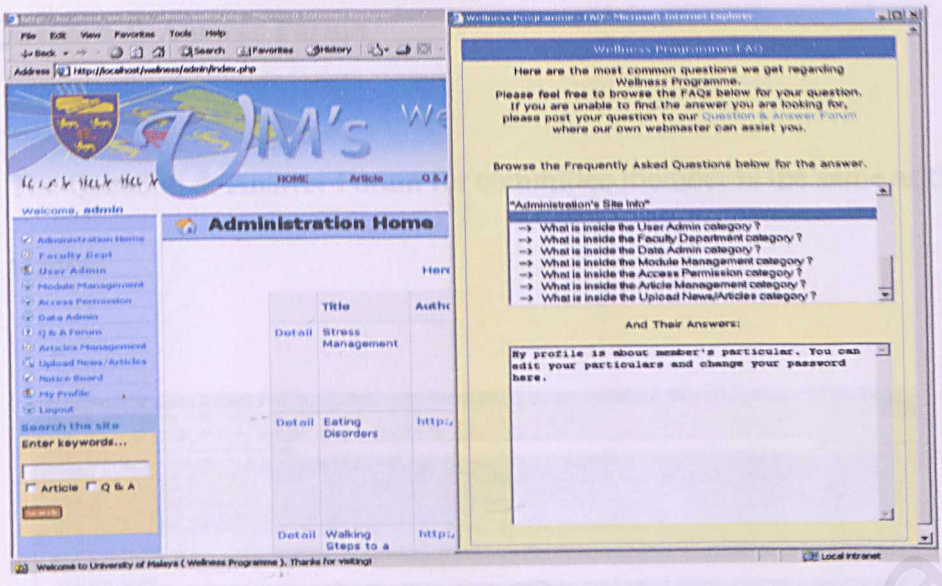



**Figure A.29 : Help Manual For Admin**

## A.4 Committee Member's Site

### A.4.1 Committee Member's Home Page

1. Upon successful login, each committee member will be display a list of most recent articles, question & answer, notices and uploaded files

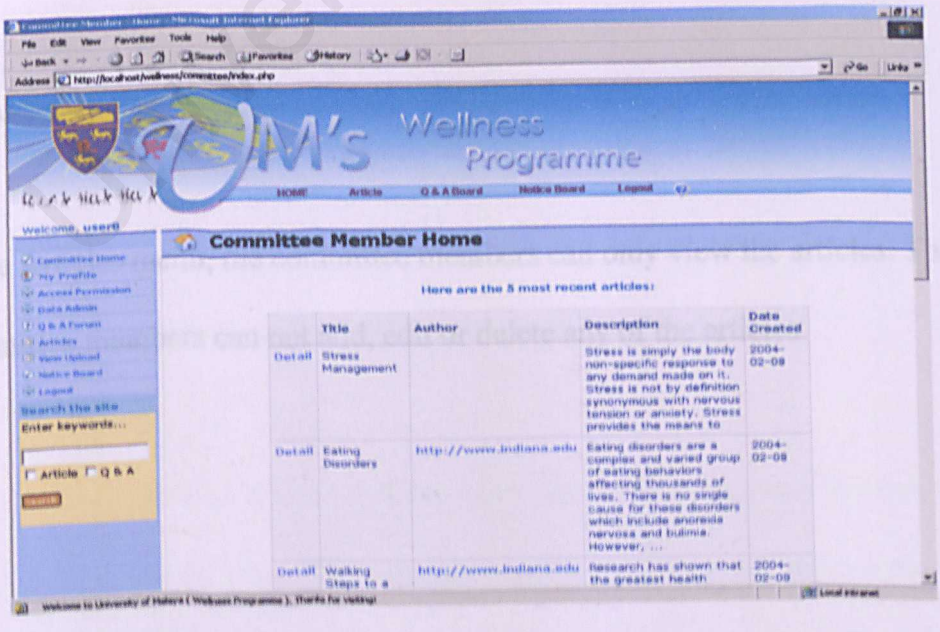



**Figure A.30 : Committee Member's Homepage**

### A.4.1 Question & Answer Forum

1. The Question & Answer Forum for committee member is the same as the visitors

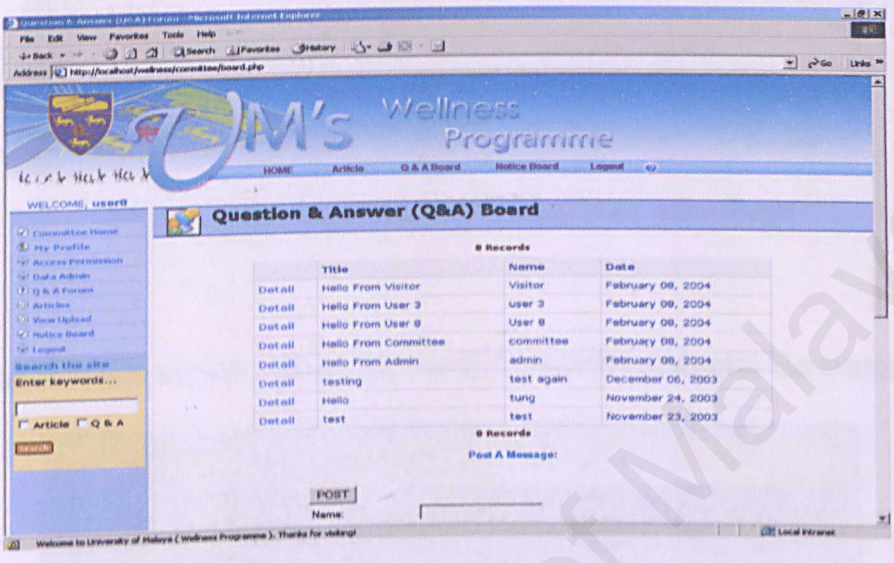



**Figure A.31 : Committee Member's Question & Answer Forum**

3. For the steps to use the Q & A Forum, please refer to A.2.3

### A.4.2 Articles

1. In the Articles menu, the committee members can only view the articles. The committee members can not add, edit or delete any of the articles

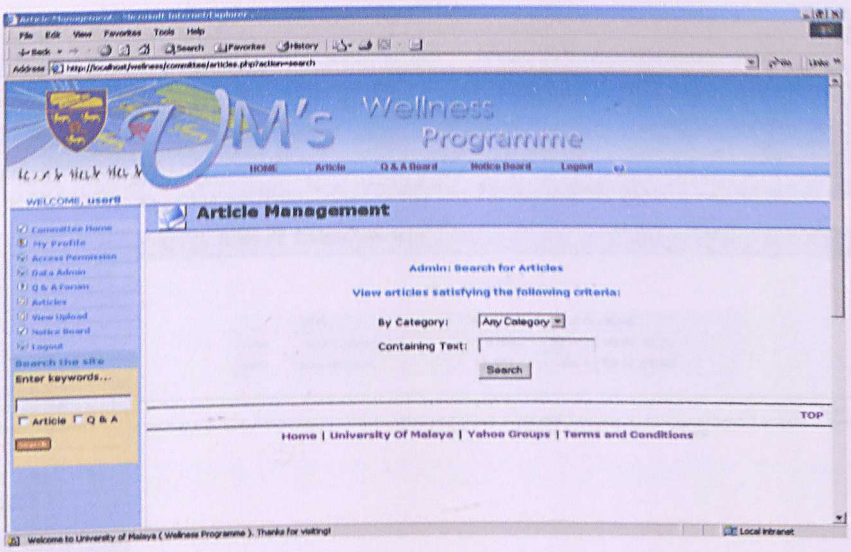



**Figure A.32 : Committee Member's Articles Page**

2. The committee members can use the search button the minimize the search

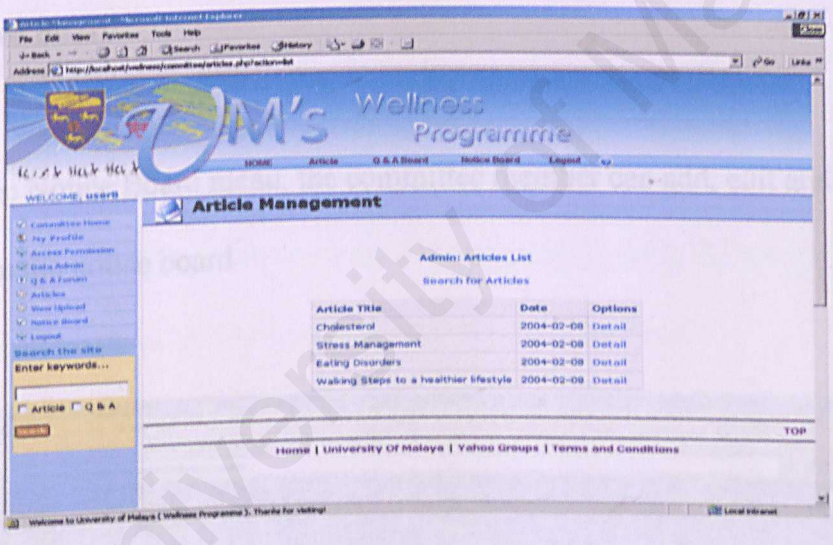



**Figure A.33 : Search Article Page**

### A.4.3 View Uploaded News / Articles

1. In the View Uploaded News / Articles menu, the committee members can only view those uploaded files. The committee members cannot upload or delete any of the files.

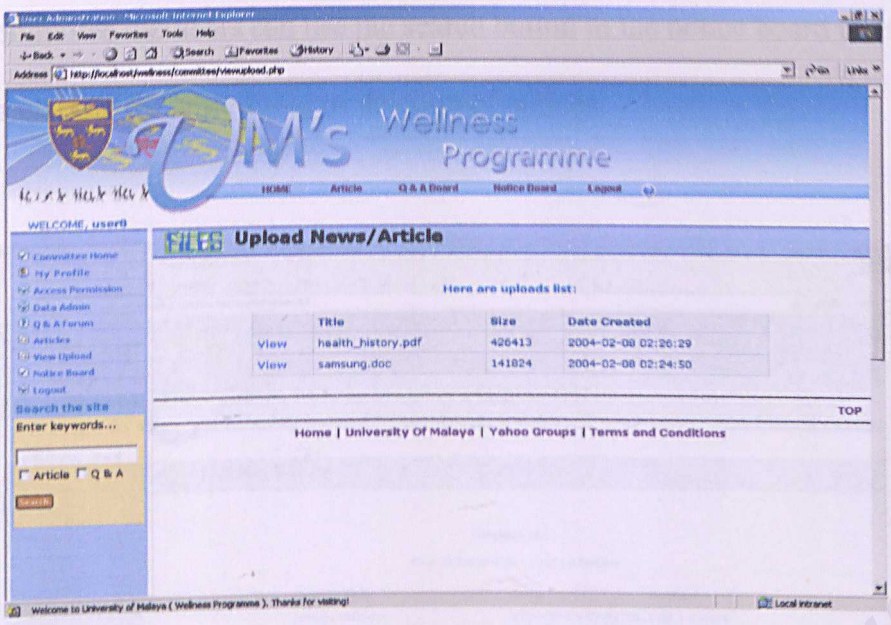



**Figure A.34 : View Uploaded Files Page**

### A.4.4 Notice Board

1. Under the Notice Board menu, the committee member can add, edit and delete the notices in the notice board

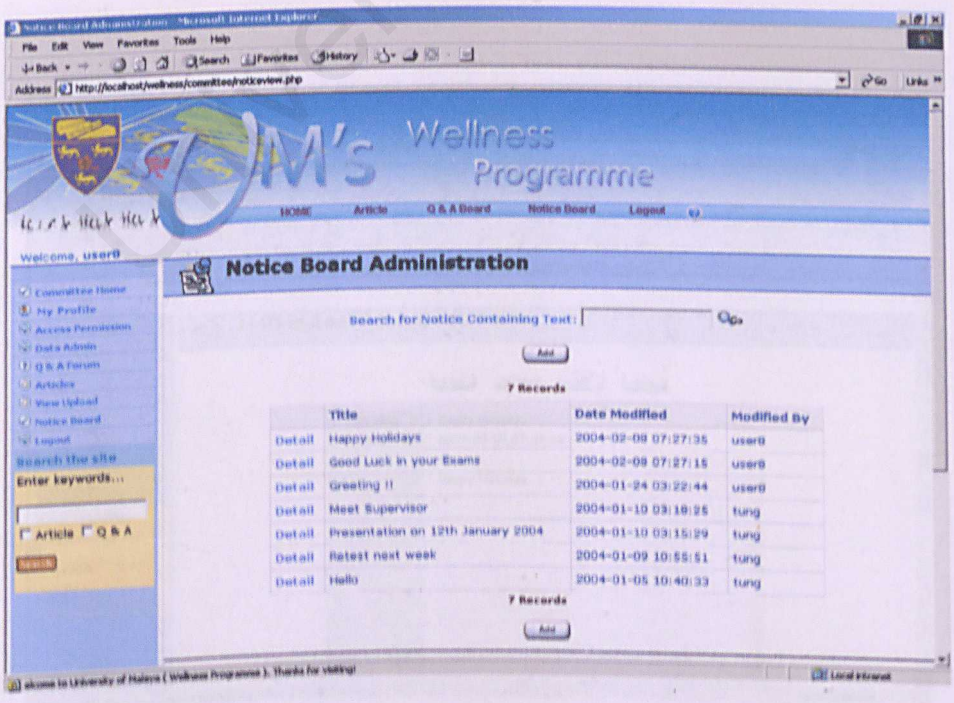



**Figure A.35 : Manage Notice Board**

2. The committee members can use the search button in the notice board to minimize the search time for any editing or deletion of notices.

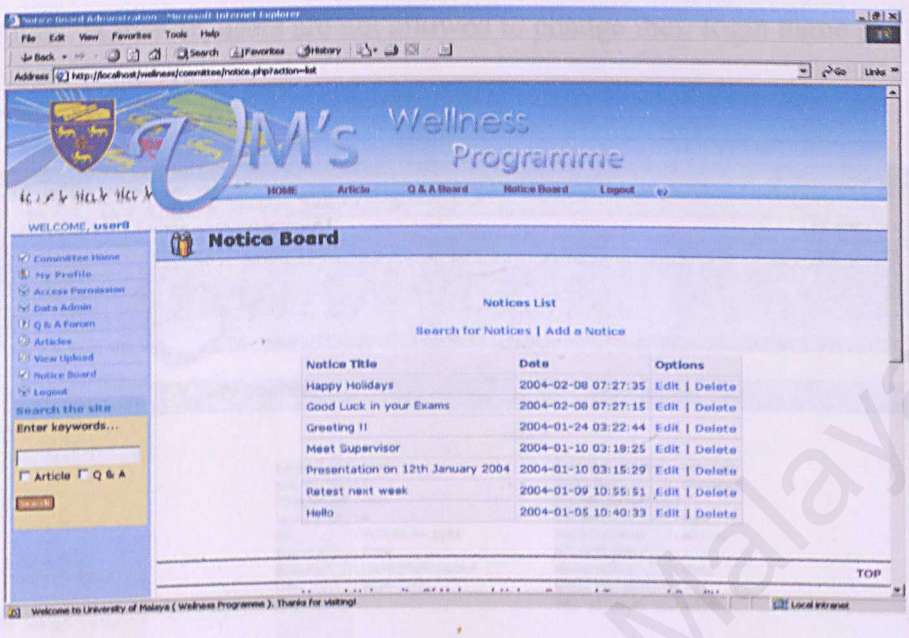



**Figure A.36 : Search Notice Board**

3. The committee members can view the full notice by clicking the detail link. For editing or deleting of any notices, just click the relevant links

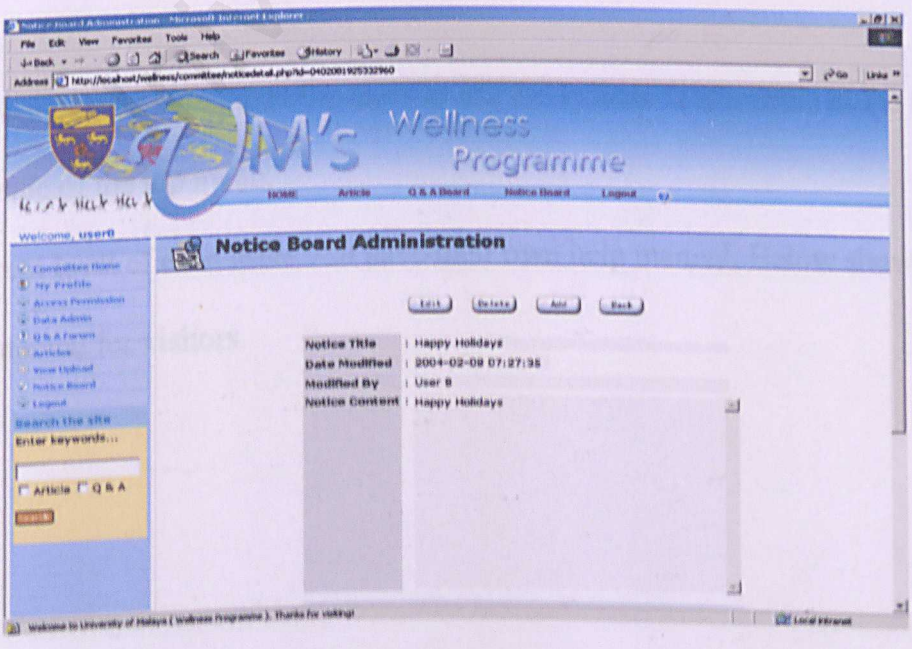



**Figure A.37 : Notice Board Detail Page**

### A.4.5 My Profile

1. Under the My Profile, each respective users can change their password and particulars. However, users are not allowed to change their login name and access level.

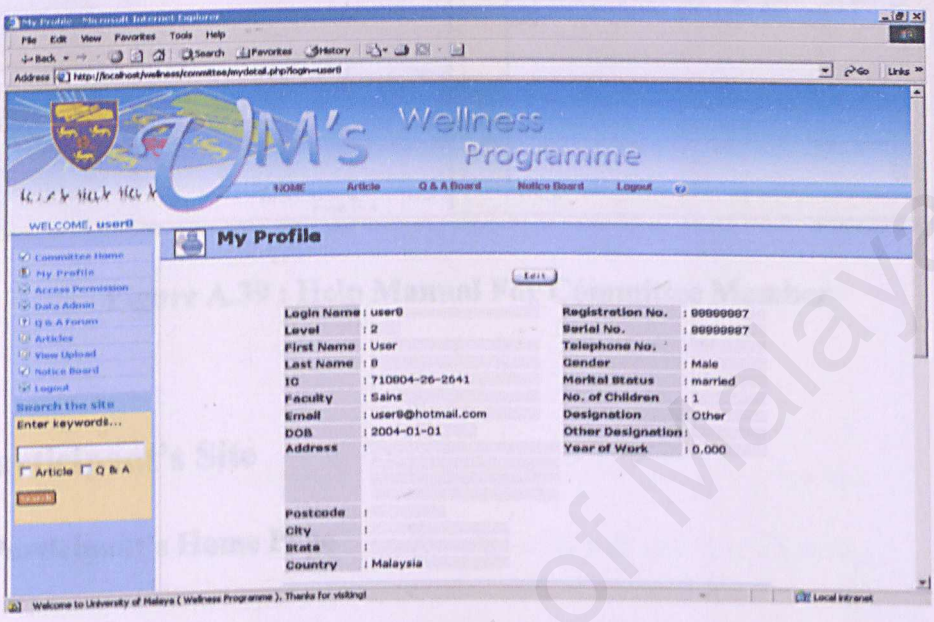



**Figure A.38 : My Profile Page**

### A.4.6 Committee Member's Help Manual

1. The help manual is to guide the users to use the system. It is located at the right hand side of the top menu.
2. Different level of each users will have their own help manual. Below shown is the help manual for visitors.

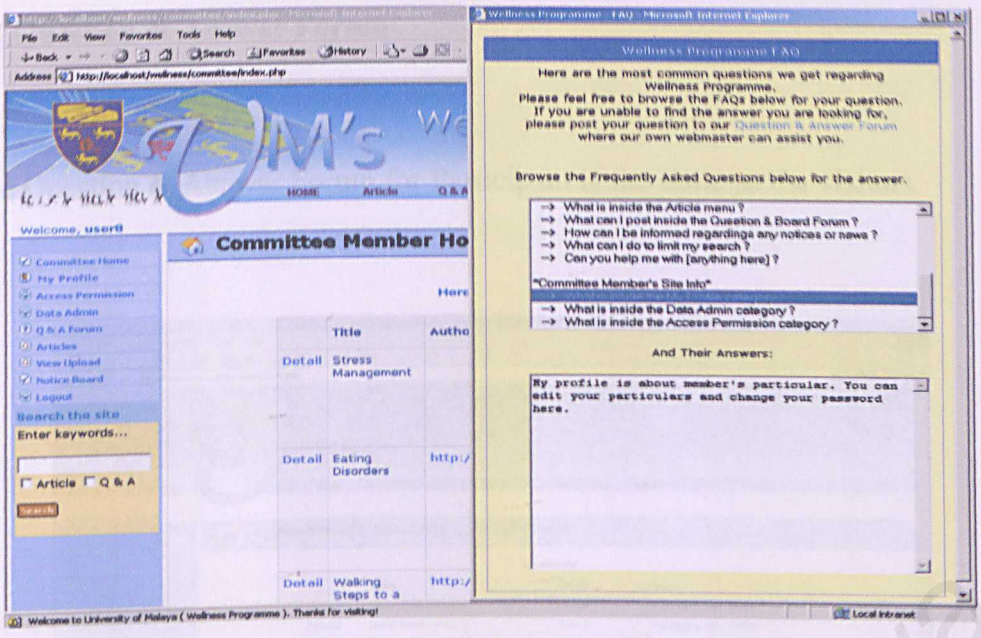



**Figure A.39 : Help Manual For Committee Member**

## A.5 Participant's Site

### A.5.1 Participant's Home Page

1. Upon successful login, each committee member will be display a list of most recent articles, question & answer, notices and uploaded files

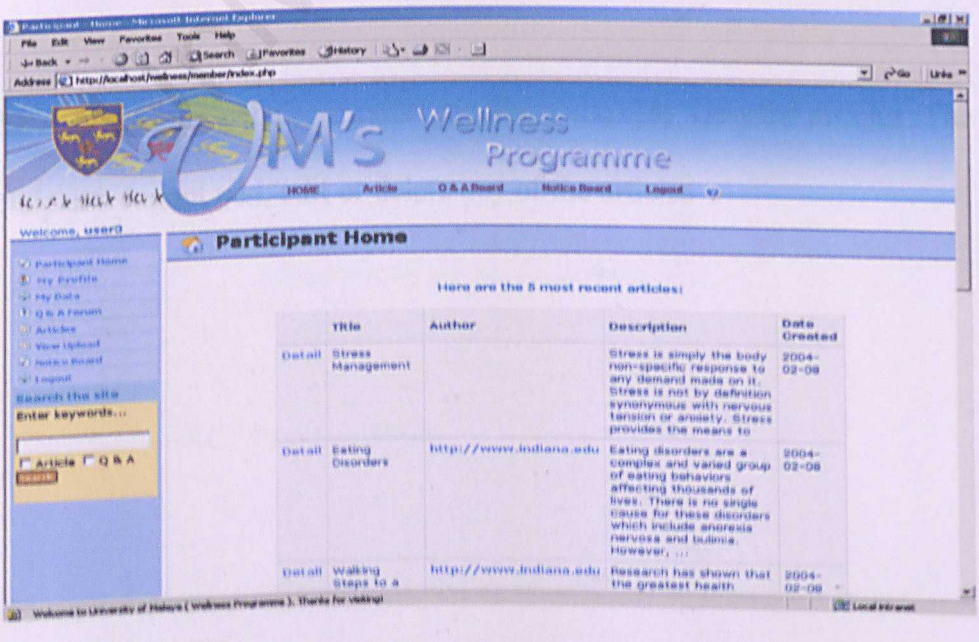



**Figure A.40 : Participant's Homepage**

## A.5.2 Question & Answer Forum

1. The Question & Answer Forum for Participant is the same as the visitors

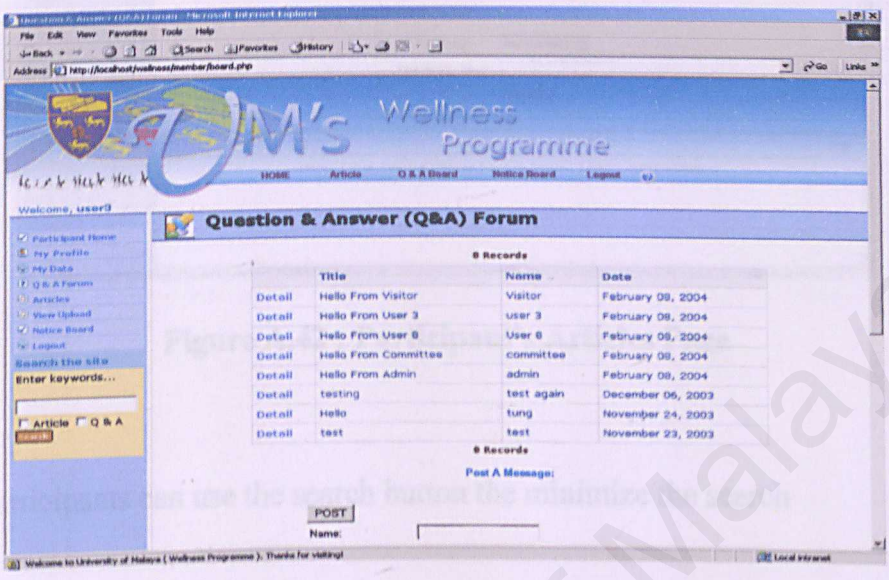



**Figure A.41 : Participant's Question & Answer Forum**

3. For the steps to use the Q & A Forum, please refer to A.2.3

## A.5.3 Articles

1. In the Articles menu, the committee members can only view the articles. The Participants cannot add, edit or delete any of the articles

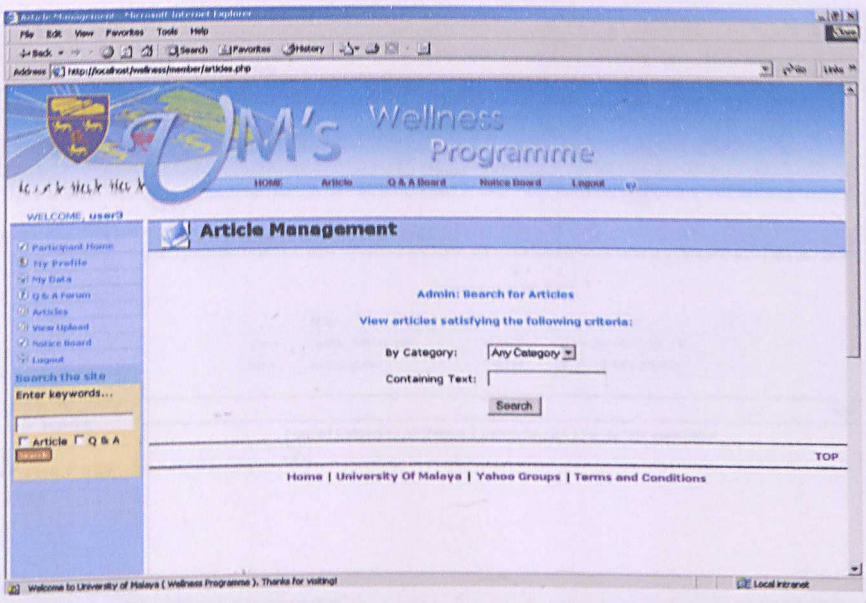



**Figure A.42 : Participant's Articles Page**

2. The Participants can use the search button the minimize the search

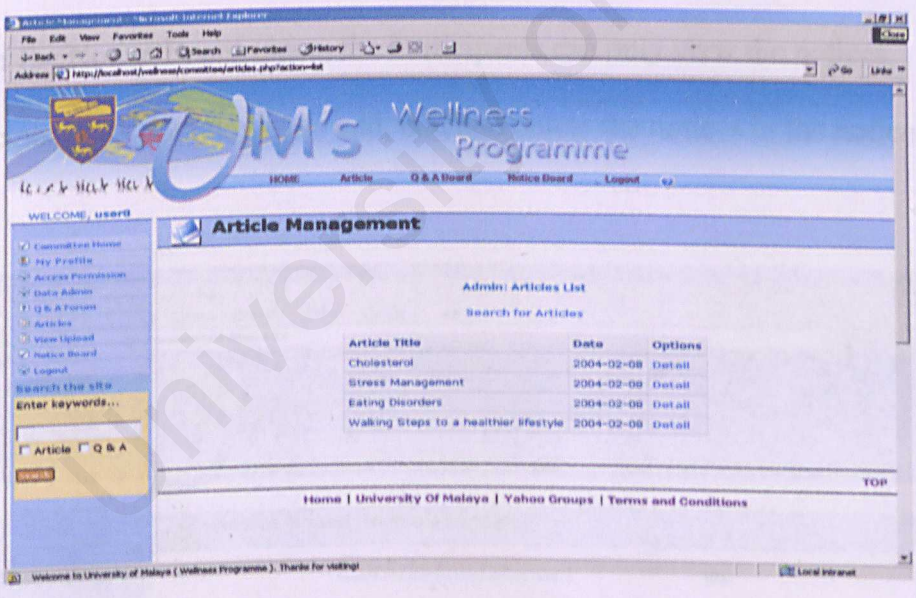



**Figure A.43 : Search Article Page**

### A.5.4 View Uploaded News / Articles

1. In the View Uploaded News / Articles menu, the Participants can only view those uploaded files. The Participants cannot upload or delete any of the files

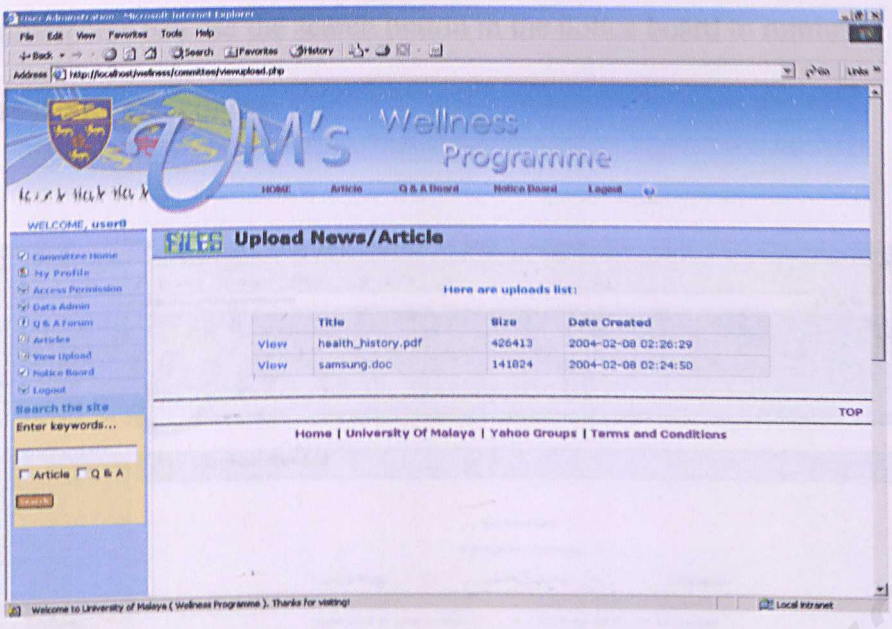



**Figure A.44 : View Uploaded Files Page**

## A.5.5 Notice Board

1. Under the Notice Board menu, the Participants can only view the notices.

   Participants are not allowed to add, edit and delete the notices in the notice board

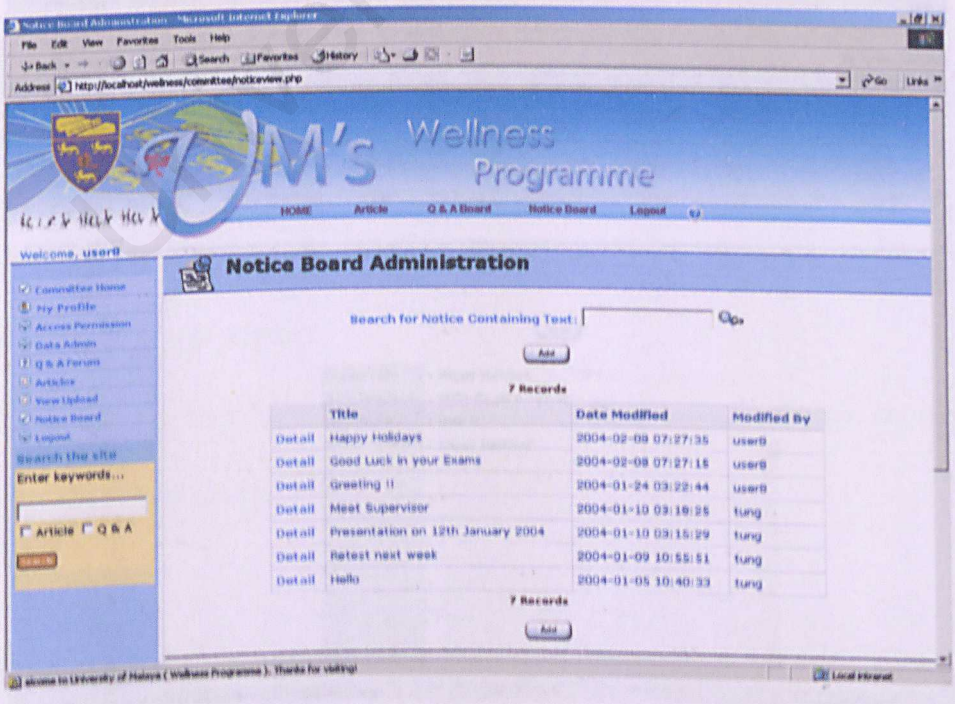



**Figure A.45 : Manage Notice Board**

2. The Participants can use the search button in the notice board to minimize the search time for any notices.

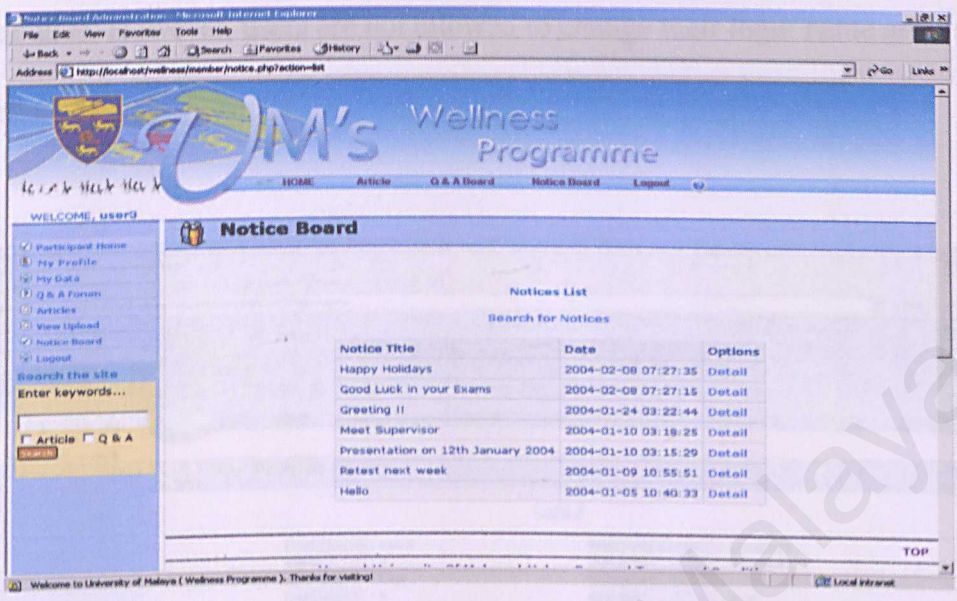



**Figure A.46 : Search Notice Board**

3. The Participants can view the full notice by clicking the detail link.

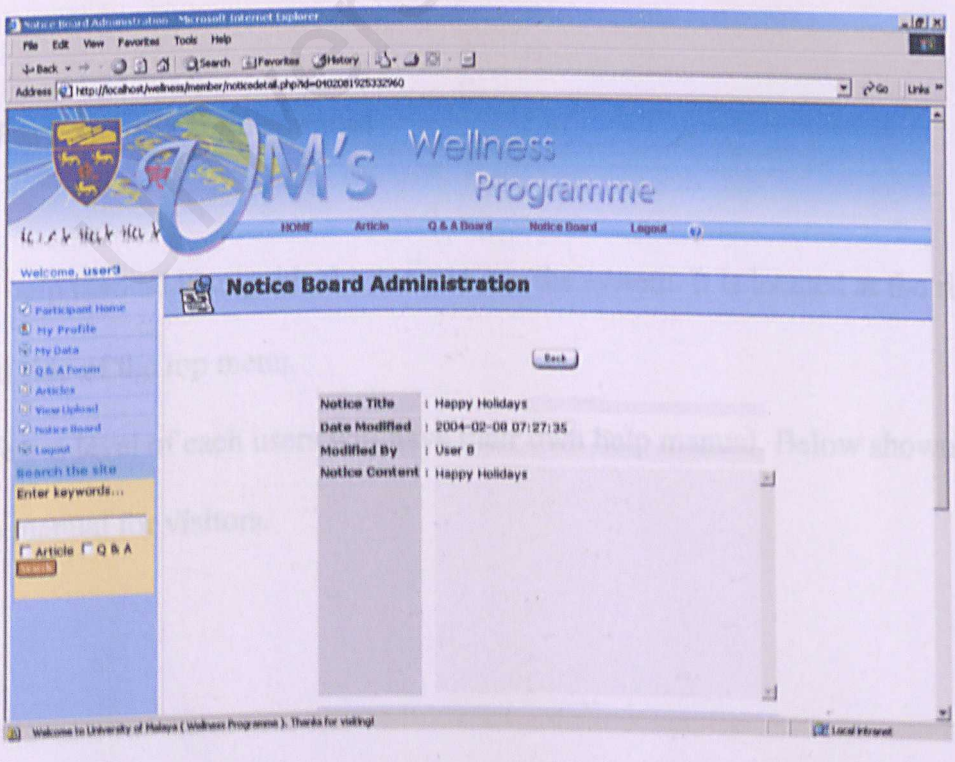



**Figure A.47 : Notice Board Detail Page**

### A.5.6 My Profile

1. Under the My Profile, each respective users can change their password and particulars. However, users are not allowed to change their login name and access level.

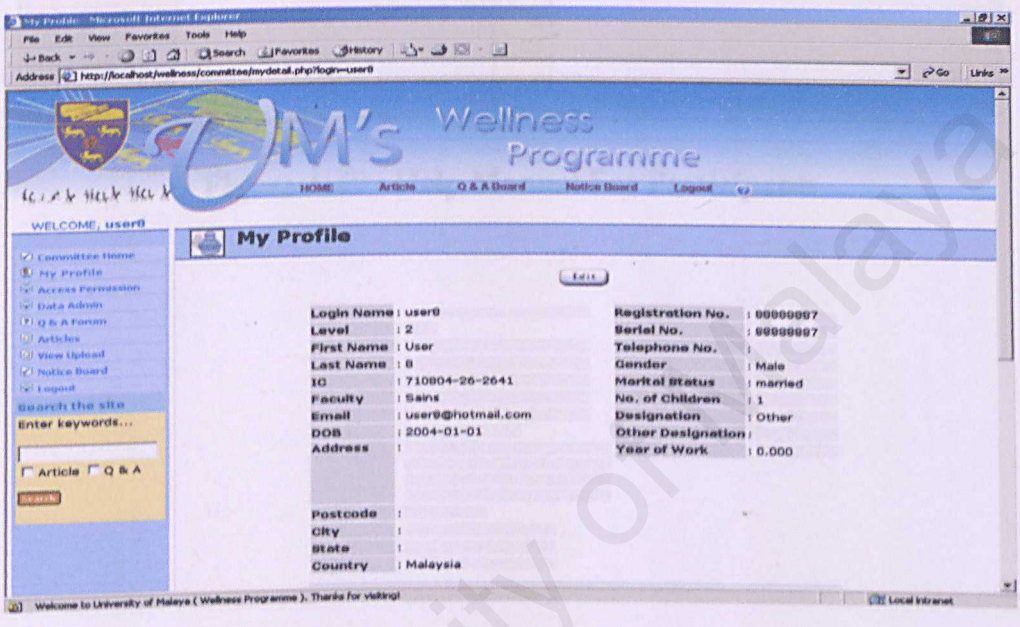



**Figure A.48 : My Profile Page**

### A.5.7 Participant's Help Manual

1. The help manual is to guide the users to use the system. It is located at the right hand side of the top menu.
2. Different level of each users will have their own help manual. Below shown is the help manual for visitors.

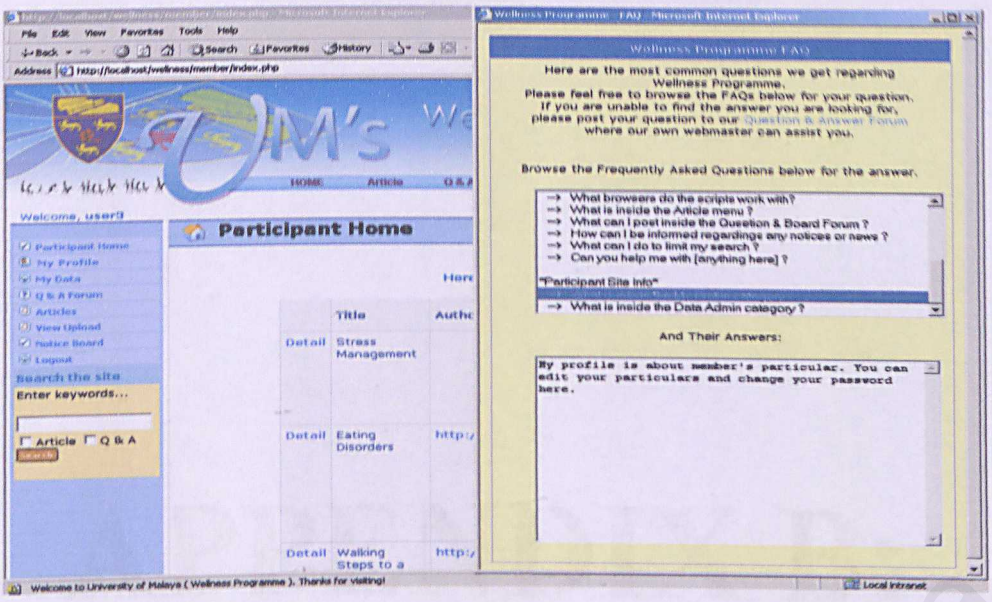



**Figure A.49 : Help Manual For Participants**

# APPENDIX B: USER ACCEPTANCE TESTING QUESTIONAIRE

# APPENDIX B: USER ACCEPTANCE TESTING QUESTIONAIRE

**User Acceptance Testing Questionnaire ( Wellness Administrator )**

Name : _____

Age : _____

Gender: Male / Female

*Instructions :*

Below are the functions in the system. For each function, please tick ( √ ) once in the column provided. If failure, please state your reasons or comments.

| Event / Function / Module | Successful | Failure | Reason / Comment |
|---|---|---|---|
| Login / Logout | | | |
| User Profile | | | |
| Access Permission | | | |
| Data Admin | | | |
| My Profile | | | |
| Article Management | | | |
| Question & Answer Forum | | | |
| Uploading Files | | | |
| Notice Board | | | |
| Search | | | |
| Help Manual | | | |
| Broken Links | | | |

**User Acceptance Testing Questionnaire ( Committee Members )**

Name : _____

Age : _____

Gender: Male / Female

*Instructions :*

Below are the functions in the system. For each function, please tick ( √ ) once in the column provided. If failure, please state your reasons or comments.

| Event / Function / Module | Successful | Failure | Reason / Comment |
|---|---|---|---|
| Login / Logout | | | |
| Access Permission | | | |
| Data Admin | | | |
| My Profile | | | |
| View Articles | | | |
| Question & Answer Forum | | | |
| View Uploading Files | | | |
| Notice Board | | | |
| Search | | | |
| Help Manual | | | |
| Broken Links | | | |

**User Acceptance Testing Questionnaire ( Participants )**

Name : _____

Age : _____

Gender: Male / Female

*Instructions :*

Below are the functions in the system. For each function, please tick ( √ ) once in the column provided. If failure, please state your reasons or comments.

| Event / Function / Module | Successful | Failure | Reason / Comment |
|---|---|---|---|
| Login / Logout | | | |
| My Profile | | | |
| My Data | | | |
| View Articles | | | |
| Question & Answer Forum | | | |
| View Uploading Files | | | |
| Notice Board | | | |
| Search | | | |
| Help Manual | | | |
| Broken Links | | | |

**User Acceptance Testing Questionnaire ( Visitors )**

Name : _____

Age : _____

Gender: Male / Female

*Instructions :*

Below are the functions in the system. For each function, please tick ( √ ) once in the column provided. If failure, please state your reasons or comments.

| Event / Function / Module | Successful | Failure | Reason / Comment |
|---|---|---|---|
| View Articles | | | |
| Question & Answer Forum | | | |
| Notice Board | | | |
| Search | | | |
| Help Manual | | | |
| Broken Links | | | |

# APPENDIX C: WELLNESS SURVEY QUESTIONAIRE

# PROGRAM WELLNESS UNIVERSITI MALAYA
# KAJISELIDIK GAYA HIDUP DAN KESIHATAN KAKITANGAN

Untuk kegunaan pejabat
*For office use*

**BUTIRAN PERIBADI** *(Personal details)*

Nama :
*Name*

No.tel/e-mail :
*Contact details (phone/e-mail)*

Umur : ___ tahun
*Age* *years*

4. Tarikh lahir : ___/___/___
*Birthdate* *dd / mm / yyyy*

Jantina :
*Sex*
☐ Lelaki / *male*
☐ Perempuan / *female*

Taraf perkahwinan :
*Marital status*
☐ Bujang/belum berkahwin / *single*
☐ Bercerai/Balu / *divorced/widowed*
☐ Berkahwin / *married*

Jika berkahwin / bercerai / balu ; bilangan anak : ___ orang
*If married / divorced / widowed* *number of children* *children*

**BUTIRAN PEKERJAAN** *(Employee details)*

Fakulti / PTJ :
*Faculty / PTJ*

Jawatan :
☐ Akademik / *Academic*
☐ Profesor / *Professor*
☐ Profesor Madya / *Associate Professor*
☐ Pensyarah / *lecturer*
☐ Pengurusan/sokongan *Management/support*
Nyatakan: *Specify*

Bilangan tahun bekerja di UM : ___ tahun
*Number of years working in UM* *years*

**PROGRAM WELLNESS** *(Wellness Programme)*

Pernahkah anda dengar mengenai konsep 'Wellness'?
*Have you ever heard about the Wellness concept?*
☐ Ya *Yes*
☐ Tidak *No*

Secara ringkas, apakah yang anda anggap sebagai 'Wellness'?
*Briefly, how would you define 'Wellness'?*

Adakah anda merasakan program ini akan memberi manfaat? ☐ Ya *Yes* ☐ Tidak *No*
*Do you think this programme will be beneficial?*

Adakah anda telah menjalani pemeriksaan kesihatan yang dianjurkan oleh Program Wellness? ☐ Ya *Yes* ☐ Tidak *No*
*Have you been through the medical check-up organised by the Wellness Programme?*

Pernahkah anda menghadiri mana-mana program Wellness selain di UM? ☐ Ya *Yes* ☐ Tidak *No*
*Have you attended any Wellness programmes other than in UM?*

Jika program ini dilaksanakan 3 kali seminggu selepas waktu pejabat, selama 6 bulan, adakah anda dapat menghadirinya? ☐ Ya *Yes* ☐ Tidak *No*
*If the programme is to be conducted 3 times a week after office hours, for 6 months, would you be able to attend?*

Jika tidak, nyatakan sebab: _____
*If not, please state reason* _____

**GAYA HIDUP & KESIHATAN** *(Lifestyle & Health)*

Adakah anda merokok?
*Do you smoke?*

☐ Tidak pernah *Never*

☐ Pernah, tetapi telah berhenti → Tempoh sejak berhenti *Duration since quit* _____ tahun/bulan *years/months*
*Used to, but quit*

☐ Ya *Yes* → Bilangan rokok sehari *Cigarettes per day* _____ puntung *cigarettes*

Adakah anda kerap bersama seorang perokok? (Tanda semua yang berkenaan)
*Are you often with someone who smokes? (Select all that applies)*

☐ Tidak / *No*
☐ Suami/Isteri / *Spouse*
☐ Lain-lain ahli keluarga / *Other family member(s)*
☐ Rakan sepejabat / *Colleague*
☐ Teman/pasangan / *Friend/partner*
☐ Lain-lain / *Others*

Secara anggaran, berapa jam kah anda tidur dalam satu malam? ___ jam *hours*
*How many hours, on average, do you sleep each night?*

dakah anda minum inuman beralkohol?
*o you take alcoholic rinks?*

☐ Tidak pernah
*Never*

☐ Pernah, tetapi telah berhenti →
*Used to, but quit*

Tempoh sejak berhenti
*Duration since quit*
_____ tahun/bulan
*years/months*

☐ Ya →
*Yes*

Bilangan kali seminggu
*Frequency per week*
_____ kali/gelas
*times/glasses*

ang manakah antara berikut paling jelas membayangkan corak perkerjaan harian anda?
*Which of the following most closely describes your daily work pattern?*

☐ Pejabat sepenuh masa / *full time office*

☐ Pejabat serta aktiviti dalam / *office and indoor activities*

☐ Aktiviti dalam dan luar / *indoor and outdoor activities*

☐ Aktiviti luar sepenuh masa / *full time outdoor*

MAKANAN *(Nutrition and Diet)*

| andakan Ya/Tidak bagi penyataan-penyatan di bawah.<br>*ndicate Yes/No for the statements below.* | Ya<br>*Yes* | Tidak<br>*No* |
|---|---|---|
| aya makan sekurang-kurangnya 3 kali sehari.<br>*eat at least 3 meals a day.* | ☐ | ☐ |
| aya tidak mengambil sarapan hampir setiap hari.<br>*skip breakfast most days.* | ☐ | ☐ |
| aya mengambil makanan tinggi kalsium (susu, ikan bilis, tulang sardin) ampir setiap hari.<br>*eat calcium-rich food (milk, anchovies, sardine bones) most days).* | ☐ | ☐ |
| Saya makan buah-buahan dan sayur-sayuran hampir setiap hari.<br>*I eat fruits and vegetables most days.* | ☐ | ☐ |
| Saya mengambil 6 hingga 8 gelas air (air kosong, jus, teh dan kopi) hampir setiap hari.<br>*I have 6 to 8 glasses of fluid (water, juice, tea and coffee) most days.* | ☐ | ☐ |
| Saya makan makanan bergoreng (mi goreng, nasi goreng, makanan segera) dan hidangan yang bersantan hamper setiap hari.<br>*I eat fried food (noodles, rice, fast food) and dishes with coconut milk most days.* | ☐ | ☐ |
| Saya mengalami sembelit hampir setiap hari.<br>*I experience constipation most days.* | ☐ | ☐ |
| Saya minum minuman tinggi tenaga (minuman ringan: Coke; Milo) lebih dari 3 kali seminggu.<br>*I drink high-energy drinks (soft drink: Coke, and Milo) more than 3 times a week.* | ☐ | ☐ |

| | | | |
|---|---|---|---|
| at badan saya telah meningkat sebanyak 5 kg dalam 6 bulan yang lepas pa kemahuan saya.<br>*thout wanting to, I have gained 5 kg in the last 6 months.* | ☐ | ☐ | |
| gi penyataan-penyataan di bawah, tanda di petak yang berkenaan;<br>r *each of the statements below, tick in the appropriate box:* | Ya<br>*Yes* | Tidak<br>*No* | Tidak tahu<br>*Don't know* |
| ahkah anda mendengar tentang Indeks Jisim Tubuh (IJT) atau dy Mass Index (BMI)?<br>*ve you heard of Body Mass Index (BMI)?* | ☐ | ☐ | ☐ |
| Jika ya, tandakan penyataan yang benar.<br>*If yes, tick the correct statement(s).* | | | |
| a. Nisbah ini menolong menilai status berat badan.<br>*This ratio helps to evaluate body weight status.* | ☐ | ☐ | ☐ |
| b. BMI = nisbah Berat Badan (kg) : Tinggi x Tinggi (m)<br>*BMI = ratio of Body Weight : Height x Height (m)* | ☐ | ☐ | ☐ |
| c. BMI > 30 disarankan untuk kurangkan risiko penyakit.<br>*BMI > 30 is recommended to reduce disease risks.* | ☐ | ☐ | ☐ |
| d. BMI < 18 menandakan kekurangan berat badan.<br>*BMI < 18 indicates underweight.* | ☐ | ☐ | ☐ |
| ang manakah antara berikut merupakan cara memasak yang lebih igalakkan untuk pemakanan sihat?<br>*Which of the following cooking methods is/are more encouraged for ealthy diet?* | | | |
| a. Menggoreng<br>*Deep fried* | ☐ | ☐ | ☐ |
| b. Mengukus<br>*Steam* | ☐ | ☐ | ☐ |
| c. Merebus<br>*Braise* | ☐ | ☐ | ☐ |
| d. Membakar<br>*Bake/grill* | ☐ | ☐ | ☐ |
| e. Menggunakan santan<br>*Use coconut milk* | ☐ | ☐ | ☐ |
| Apakah kepentingan makanan tinggi serat seperti bijirin, sayur-sayuran, buah-buahan dan produk mil penuh dalam jumlah yang cukup?<br>*What is/are the importance of high fibre food such as oats, vegetables, fruits and whole meal products in an appropriate amount?* | | | |
| a. Memudahkan pembuangan air besar.<br>*To ease bowel movement.* | ☐ | ☐ | ☐ |
| b. Meningkatkan berat badan.<br>*To increase body weight.* | ☐ | ☐ | ☐ |
| c. Memberi rasa kenyang.<br>*To give the feeling the fullness.* | ☐ | ☐ | ☐ |
| d. Sebagai sumber pelbagai jenis vitamin dan mineral.<br>*BMI < 18 indicates underweight.* | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| Antara pilihan makanan yang berikut, yang manakah harus dikurangkan?<br>*Which of the food choices below should be reduced?* | | | | | |
| a. Kulit ayam<br>*Chicken skin* | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Roti Mil Penuh<br>*Whole meal bread* | ☐ | ☐ | ☐ | ☐ | ☐ |
| c. Kuih Manis<br>*Sweet dessert* | ☐ | ☐ | ☐ | ☐ | ☐ |
| d. Sirap minuman<br>*Syrup drink* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Petua bijak membeli dan memilih yang manakah harus diikuti ketika membeli bahan makanan?<br>*Which of the smart tips/guides is suitable when shopping for food?* | | | | | |
| a. Membeli makanan yang paling murah harganya tanpa mengambilkira nilai pemakanannya.<br>*Buy the cheapest without considering the nutritional value.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Membaca label pada bungkusan makanan sebelum membeli.<br>*Read the label on the food packaging before buying.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| c. Merancang pembelian makanan terlebih dahulu.<br>*Plan well before shopping.* | ☐ | ☐ | ☐ | ☐ | ☐ |

**KECERGASAN FIZIKAL** *(Physical fitness)*

| Bagi penyataan-penyataan dibawah, tanda di petak yang berkenaan;<br>*For each of the statements below, tick in the appropriate box;* | tidak / tak pernah / amat jarang<br>*no / never / hardly ever* | jarang<br>*occasionally / rarely* | kadang-kadang / mungkin<br>*sometimes / maybe* | sering / kerap<br>*often* | selalu / sentiasa<br>*yes / always / usually* |
|---|---|---|---|---|---|
| Saya membuat senaman sekurang-kurangnya 10 minit 3 kali seminggu.<br>*I do some type of exercise for at least 10 minutes 3 times a week.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Aktiviti harian saya melibatkan aktiviti fizikal.<br>*My daily activities include some physical exertion.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya membuat senaman kardiovaskular 3 kali seminggu.<br>*I perform some type of carkiovascular exercise 3 times a week.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya berjalan bila-bila mungkin.<br>*I walk whenever possible.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mengenalpasti dan menuruti keperluan tubuhbadan saya untuk bersenam.<br>*I recognise and listen to my body's need to exercise.* | ☐ | ☐ | ☐ | ☐ | ☐ |

## ANAN & KESIHATAN MENTAL *(Stress & Mental Health)*

i penyataan-penyataan dibawah, tanda di petak yang
kenaan;
*each of the statements below, tick in the appropriate box:*

| | tidak / tak pernah / amat jarang *no / never / hardly ever* | jarang *occasionally / rarely* | kadang-kadang / mungkin *sometimes / maybe* | sering / kerap *often* | selalu / sentiasa *yes / always / usually* |
|---|---|---|---|---|---|
| ya berhenti beberapa kali sehari untuk mengenalpasti cara rnafasan saya.<br>*pause several times a day to notice the way I breathe.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| ya duduk dalam posisi yang tenang dengan tulang belakang ya tegak.<br>*sit in a relaxed, upright posture with my spine relatively raight.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| aya bertakafur atau berehat sekurang-kurangnya 10 minit sehari.<br>*meditate or relax at least 10 minutes a day.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| aya tenang dengan diri saya.<br>*am at peace with myself.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| aya menentukan tahap kesihatan dan tekanan saya setiap hari.<br>*assess my current state of health and stress level on a daily evel.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Kerja saya tidak terlalu memberi tekanan.<br>*My work is not overly stressful.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya tahu bagaimana untuk menangani tekanan saya dengan berkesan.<br>*I know how to manage my stress effectively.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mengambil masa untuk menangani tekanan saya.<br>*I take time out to manage my stress.* | ☐ | ☐ | ☐ | ☐ | ☐ |

## ANGGUNGJAWAB DIRI *(Self-responsibility)*

Bagi penyataan-penyataan dibawah, tanda di petak yang berkenaan;
*For each of the statements below, tick in the appropriate box:*

| | tidak / tak pernah / amat jarang *no / never / hardly ever* | jarang *occasionally / rarely* | kadang-kadang / mungkin *sometimes / maybe* | sering / kerap *often* | selalu / sentiasa *yes / always / usually* |
|---|---|---|---|---|---|
| Hidup saya ditangan saya dan saya mengawalnya.<br>*My life is in my hands and I control it.* | ☐ | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| aya sedar bahawa saya bertanggungjawab terhadap semua aspek ehidupan saya.<br>*am aware that I am responsible for every aspect of my life.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Cara saya menjalankan kehidupan saya penting dalam nenentukan tahap kesihatan saya.<br>*The way I live my life is important in determining my state of health.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya adalah kuasa utama dalam menentukan kadar saya sembuh dari sesuatu penyakit.<br>*I am the major force in determining my rate of recovery from an illness.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya berfikiran terbuka dan telah mencuba pelbagai rawatan alternatif.<br>*I am open minded and have tried various alternative therapies.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya menyumbangkan masa/wang untuk menyokong usaha atau kumpulan pilihan saya.<br>*I contribute time/money to support causes or people of my choice.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya melakukan sekurang-kurangnya satu jasa baik terhadap manusia sehari.<br>*I perform at least one good deed for mankind a day.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Jika saya akan mengalami kecemasan kereta saya, saya telah bersedia.<br>*If I were to have an emergency with my car, I would be prepared.* | ☐ | ☐ | ☐ | ☐ | ☐ |

**ERHUBUNGAN SOSIAL** *(Communication & Relationship)*

| Bagi penyataan-penyataan dibawah, tanda di petak yang berkenaan;<br>*For each of the statements below, tick in the appropriate box;* | tidak / tak pernah / amat jarang<br>*no / never / hardly ever* | jarang<br>*occasionally / rarely* | kadang-kadang / mungkin<br>*sometimes / maybe* | sering / kerap<br>*often* | selalu / sentiasa<br>*yes / always / usually* |
|---|---|---|---|---|---|
| Saya gemar berkongsi minat saya dengan orang lain.<br>*I enjoy sharing my interests with others.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya tidak mengendahkan pandangan negatif orang lain terhadap saya.<br>*I can let go of the negative judgements that others have of me.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya seorang pendengar yang baik.<br>*I am a good listener.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya tidak bertanggungjawab terhadap kebahagiaan orang lain.<br>*I am not responsible for other people's happiness.* | ☐ | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| Saya mampu mempercayai dan bersifat terbuka mengenai diri saya kepada orang lain.<br>*I am able to trust and open up easily about myself to another.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mudah memberi pujian kepada orang lain.<br>*I easily give compliments to others.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya berupaya untuk berkata 'tidak' kepada orang lain tanpa terasa bersalah.<br>*I am able to say "no" to people without feeling guilty.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mempunyai sekurang-kurangnya tiga orang sahabat akrab.<br>*I have at least three close friends.* | ☐ | ☐ | ☐ | ☐ | ☐ |

**KESIHATAN SEKSUAL** *(Sexual health)*

| Tandakan Ya/Tidak bagi penyataan-penyatan di bawah.<br>*Indicate Yes/No for the statements below.* | Ya<br>*Yes* | Tidak<br>*No* |
|---|---|---|
| Pernahkah anda dengar berkenaan jangkitan salur kencing?<br>*Have you heard of urinary tract infections?* | ☐ | ☐ |
| Pernahkah anda dengar berkenaan pemeriksaan sendiri payudara?<br>*Have you heard of breast self-examination?* | ☐ | ☐ |
| Adakah anda merasakan bahawa kanser payudara boleh dirawati?<br>*Do you think breast cancer can be treated?* | ☐ | ☐ |
| Saya tiada masalah melihat diri saya di dalam cermin.<br>*I am comfortable looking at myself in a mirror.* | ☐ | ☐ |
| Menyentuh organ seksual sendiri adalah sesuatu yang memalukan.<br>*It is embarrassing to touch your own sexual organs.* | ☐ | ☐ |
| Menyentuh organ seksual sendiri adalah salah dan berdosa.<br>*It is wrong and sinful to touch your own sexual organs.* | ☐ | ☐ |
| Jika tidak melakukan pemeriksaan badan sendiri, tiada simptom akan ditemui oleh itu tidak akan ada penyakit.<br>*If you do not examine your own body, there will be no symptoms and therefore there will be no disease.* | ☐ | ☐ |
| Saya tiada masalah menyentuh dan mengenali badan saya.<br>*I feel comfortable touching and exploring my body.* | ☐ | ☐ |
| Pernahkah anda melambatkan pemeriksaan/perubatan kerana anda tidak mahu pemeriksaan rapi organ seksual dan alat kelamin?<br>*Have you ever delayed going for check-up/treatment because you did not want an internal examination of your sexual and reproductive organs (genitalia)?* | ☐ | ☐ |
| Untuk dijawab oleh kaum wanita sahaja.<br>*To be answered by females only.* | | |
| Adakah anda melakukan pemeriksaan sendiri payudara?<br>*Do you practice breast self-examination?* | ☐ | ☐ |

| | | |
|---|---|---|
| Jika anda mempunyai kegatalan, kesakitan atau sebagainya pada alat kelamin anda, adakah anda<br>*If you have a vaginal condition (itchiness, pain etc.), do you*<br>a) cuba merawatnya sendiri?<br>*try to treat it yourself?* | ☐ | ☐ |
| b) terus berjumpa doktor?<br>*go straight to the doctor?* | ☐ | ☐ |
| c) biarkannya hingga berminggu dan berharap ianya akan hilang?<br>*leave it for weeks and hope it will disappear?* | ☐ | ☐ |

**SPIRITUAL** *(Spirituality)*

Bagi penyataan-penyataan dibawah, tanda di petak yang berkenaan;
*For each of the statements below, tick in the appropriate box;*

| | tidak / tak pernah / amat jarang<br>*no / never / hardly ever* | jarang<br>*occasionally / rarely* | kadang-kadang / mungkin<br>*sometimes / maybe* | sering / kerap<br>*often* | selalu / sentiasa<br>*yes / always / usually* |
|---|---|---|---|---|---|
| Saya melihat masalah sebagai peluang untuk berkembang.<br>*I perceive problems as opportunities for growth.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya percaya bahawa saya "ada iktibar di sebalik setiap kejadian".<br>*I believe that "everything happens for a reason".* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya sedar akan kuasa pemikiran 'subconcious' saya.<br>*I am aware of the power of my subconscious mind.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya menggunakan teknik untuk menggunakan kuasa 'subconcious' saya.<br>*I use techniques to access the powers of my subconscious.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mempunyai kepercayaan spiritual mengenai alam and kuasa yang lebih besar dari saya.<br>*I have spiritual beliefs about the universe/higher being.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya percaya bahawa saya adalah sebahagian daripada suatu kejadian yang lebih besar dan universal.<br>*I believe that I am part of a larger, universal consciousness.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| Saya mampu melepaskan segala kawalan dan membiarkan sesuatu situasi terlaksana dengan sendirinya.<br>*I am able to let go of control and allow a situation to work out on its own.* | ☐ | ☐ | ☐ | ☐ | ☐ |

**TERIMA KASIH**
***THANK YOU***

# APPENDIX D: MOUTH DIAGNOSIS QUESTIONAIRE

KLINIK DIAGNOSIS MULUT
FAKULTI PERGIGIAN, UNIVERSITI MALAYA

Nama Pesakit: _____ No. Pendaftaran: _____

Tarikh lahir: _____ Jantina: _____

**Aduan** : _____

_____

_____

**Riwayat Aduan:** _____

_____

_____

**Riwayat Perubatan** (Sila rujuk senarai riwayat perubatan yang disediakan)

Ko-mobiditi: Tiada ☐ Ada ☐ _____
(Mobiditi sampingan) _____

**Riwayat Pergigian:**

Rawatan:

| | | | | | | |
|---|---|---|---|---|---|---|
| Pemeriksaan sahaja | ☐ | Penskaleran | ☐ | Restorasi | ☐ | |
| Dentur | ☐ | Pembedahan | ☐ | Cabutan | ☐ | sebab-sebab: |
| Ortodontik | ☐ | Lain-lain | ☐ | | | _____ |

_____

Cara higin mulut:

| | | | | | |
|---|---|---|---|---|---|
| Memberus gigi | ☐ | Memflos | ☐ | Berkumur | ☐ |
| Lain-lain | ☐ | _____ | | | |

**Riwayat keluarga :**

Masalah kesihatan Tiada ☐ Ada ☐ _____

**Tabiat**

| | | | | | |
|---|---|---|---|---|---|
| Merokok | ☐ | Menghisap jari | ☐ | Meminum alkohol | ☐ |
| Bruksisme | ☐ | Mengunyah sireh | ☐ | Minum dari botol | ☐ |
| Lain-lain | ☐ | _____ | | | |

PEMERIKSAAN KLINIKAL

| | Normal | Tidak normal | |
|---|---|---|---|
| Muka | ☐ | ☐ | _____ |
| Bibir | ☐ | ☐ | _____ |
| Pembukaan mulut | ☐ | ☐ | _____ |
| Sendi Temporomandibel | ☐ | ☐ | _____ |
| Nodus Limfa | ☐ | ☐ | _____ |
| Lain-lain | ☐ | ☐ | _____ |

Tempat Aduan _____

_____

_____

_____

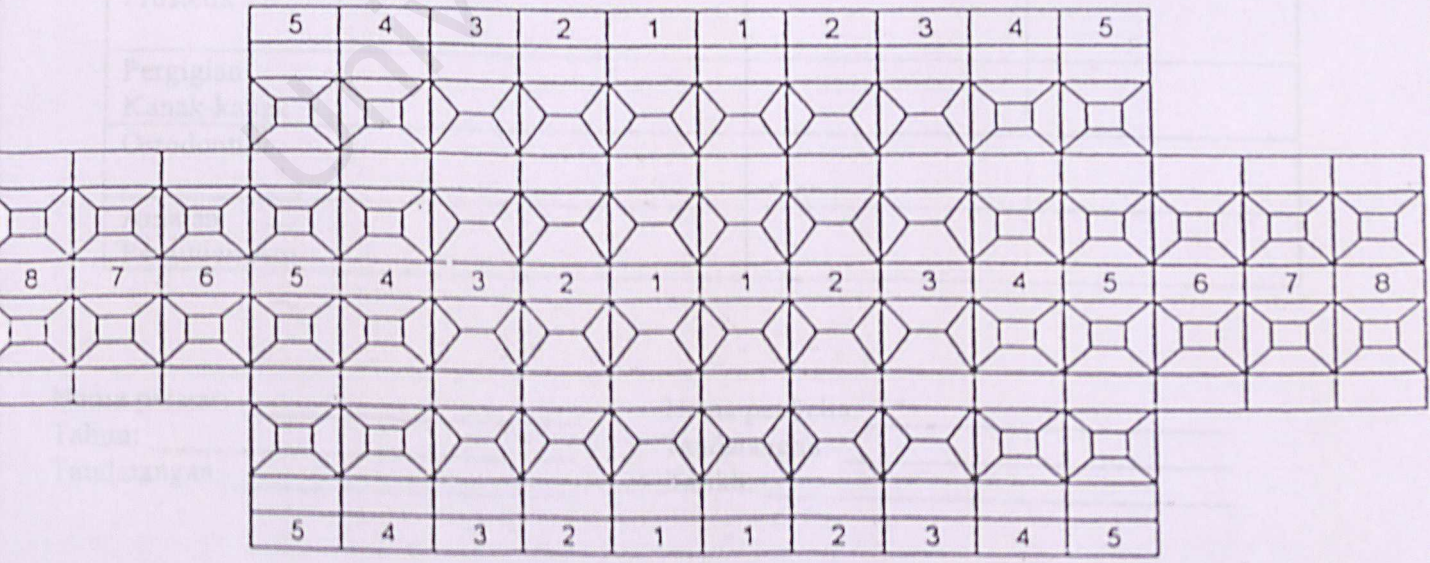
| | Normal | Tidak normal | |
|---|---|---|---|
| Bibir | ☐ | ☐ | _____ |
| Lidah | ☐ | ☐ | _____ |
| Lantai mulut | ☐ | ☐ | _____ |
| Mukosa bukal | ☐ | ☐ | _____ |
| Kelangit | ☐ | ☐ | _____ |
| Faring | ☐ | ☐ | _____ |
| Lain-lain | ☐ | ☐ | _____ |

**PERIODONTUM**

| | Normal | Tidak Normal | |
|---|---|---|---|
| Gingiva | ☐ | ☐ | _____ |
| | **Tiada** | **Ada** | |
| Pendarahan semasa diprob | ☐ | ☐ | _____ |
| Pempoketan | ☐ | ☐ | _____ |
| Kegoyahan gigi | ☐ | ☐ | _____ |
| Penglibatan percabangan | ☐ | ☐ | _____ |
| Resesi gingiva | ☐ | ☐ | _____ |

Higin mulut Baik ☐ Sederhana ☐ Buruk ☐

**CARTA PEMERIKSAAN**




| Petunjuk | | | | | | |
|---|---|---|---|---|---|---|
| | Karies | ○ | Tiada gigi | —— | Fruktur | ⫽ |
| | Tampalan | ▨ | Akar tertinggal | ┼ | Tak tererup | U |
| | Korona | ▽ | Akar bertampal | RF | Fissur dalam | DF |
| | Jambatan | ▽—▽ | Pulpa tak vital | NV | Diperhatikan | KIV |

RANCANGAN RAWATAN

Kecemasan:

Sementara:

Tetap:

RUJUKAN

| Jabatan | Senarai Menunggu (Mengikut keutamaan) | Panggilan bertugas | Untuk kegunaan pejabat |
|---|---|---|---|
| Pergigian Masyarakat | | | |
| Periodontologi | | | |
| Pembedahan Mulut | | | |
| Perubatan dan Patologi Mulut | | | |
| Pemeliharaan Gigi | | | |
| Prostetik | | | |
| Pergigian Kanak-kanak | | | |
| Ortodontik | | | |
| Amalan Pergigian Am | | | |

Nama pelajar: _____
Tahun: _____
Tandatangan: _____

Nama penyelia: _____
Tandatangan: _____
Tarikh: _____

Masira Tarmat

STATUS KEGIGIAN

Maloklusi: Kelas I ☐ Kelas II/Bhg I ☐ Kelas II/Bhg II ☐ Kelas III ☐

| | Tiada | Ada | |
|---|---|---|---|
| Karies | ☐ | ☐ | _____ |
| Atrisi /Abrasi/ Erosi | ☐ | ☐ | _____ |
| Perubahan warna | ☐ | ☐ | _____ |
| Kesesakan | ☐ | ☐ | _____ |
| Keruangan | ☐ | ☐ | _____ |
| Kecederaan gigi | ☐ | ☐ | _____ |
| Prostesis/Aplians | ☐ | ☐ | _____ |

Lain-lain: _____

DIAGNOSIS

_____

_____

_____

_____

_____

_____

_____

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